

DECserver 300

Hardware Installation

April 1990

This manual explains how to install the DECserver 300 system and how to verify its operation. The manual also describes the DECserver 300 hardware controls and indicators. This manual is intended for the hardware installer and the server manager.

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Preface

Intended Audience

The DECserver 300 Hardware Installation/Owner's Guide is intended for the hardware installer. The installer is responsible for ensuring that the hardware is installed and tested. The person installing the DECserver 300 software can then verify the system installation.

NOTE

The DECserver 300 system is comprised of a DECserver 300 hardware unit and DECserver 300 software.

Structure of This Document

The DECserver 300 Hardware Installation/Owner's Guide contains the following chapters and appendixes:

- | | |
|-----------|--|
| Chapter 1 | Provides an overview of the system installation. |
| Chapter 2 | Describes how to unpack and check the contents of the shipment. |
| Chapter 3 | Describes how to verify that the site is prepared for installation and lists the technical specifications of the server. |
| Chapter 4 | Provides instructions for installing and testing the server hardware. |
| Chapter 5 | Provides simple troubleshooting steps to correct problems encountered during the hardware installation. |

- Appendix A Describes connector pins for the various server connectors and also describes various cables, adapters and accessories used with the server.
- Appendix B Lists the port devices which are supported by the server.
- Appendix C Describes procedures to cable to the network and to port devices.
- Appendix D Provides information on ordering the server, server accessories and server cables.
- Appendix E Describes how to order Documents.

Other DECserver 300 Manuals

- *Using the DECserver 300 Introduction*

Outlines the DECserver 300 system, hardware and software, and provides information for using, expanding or reconfiguring the server. Describes the remaining documentation and flowcharts logical reading sequences for different audiences. This document is intended for any user of the DECserver 300 Documentation Set.

- *DECserver 300 Identification Card*

Provides the space to record the serial number, Ethernet Address, DECnet node address, and DECnet node name of the server. This document is intended for the network manager, the software installer, and the server manager.

- *DECserver 300 Software Installation (op-sys)*

Explains how to install the DECserver 300 distribution software, how to establish down-line load hosts, and how to verify the DECserver 300 system installation. In the title, (op-sys) is the name of the load host operating system. This guide is intended for the load host system manager and the server manager.

- *DECserver 300 Use*

Describes the user interface and the general functions of the server. This guide provides complete information for using all nonprivileged server commands. This guide is intended for user's of interactive terminals connected to DECserver 300 ports.

- *Terminal Server User's Reference Card*

Describes and gives examples of the most frequently used nonprivileged server commands on a reference card. This card is intended for users of interactive terminals connected to server ports.

- *DECserver 300 Management*

Describes all the initial and day-to-day management tasks required to the DECserver 300 manager. The topics cover all the information needed to configure the ports and to customize the permanent and operational databases of the server. This guide is intended to the DECserver 300 manager.

- *Terminal Server Commands and Messages Reference*

Describes the usage and syntax of all terminal server commands. This reference also lists and describes all status and error messages issued by the server. This reference is intended for the server manager but is useful for terminal users who want more detailed reference information.

- *DECserver 300 Technical Description*

Describes hardware logic, software and diagnostic firmware. This manual is intended for use in training, in field service, and in manufacturing. The level of technical information assumes previous training or experience with Ethernet networks and with Digital Equipment Corporation's VAX-11 or PDP-11 architecture.

- *Local Area Transport (LAT) Network Concepts*

Describes the Local Area Transport (LAT) protocol, and LAT network concepts. This document is intended for the server manager, the system manager, and the network manager.

- *Terminal Server Glossary*

Defines terms used in the server documentation sets. This is intended as a reference tool for all users of server documentation.

DECserver 300 On-Line Documentation

- *DECserver 300 Release Notes*

Describes any discrepancies between the actual product and the information in the documentation set. These notes are intended for the software installer and the DECserver 300 manager.

- *On-Line Help*

Provides two forms of server help: tutorial help and command reference help. Tutorial help provides basic information about logging in and using the server. Command reference help provides detailed information about using all the server commands available at your privilege level. Help is intended for all server users.

Associated Documents

- *Guide to Terminal Server Manager and Terminal Server Manager Software Installation Guide*

These documents contain the information necessary to install and run the Terminal Server Manager (TSM) software, an optional network management product, which is installed onto a VAX/VMS system running DECnet-VAX. These guides describe how to use TSM to manage a mix of Digital Equipment Corporation Ethernet terminal servers connected for the installer and manager of the TSM software product.

Overview

1.1 Installation Overview

Installing the DECserver 300 system consists of:

- Installing the hardware
- Installing the software
- Verifying the system installation

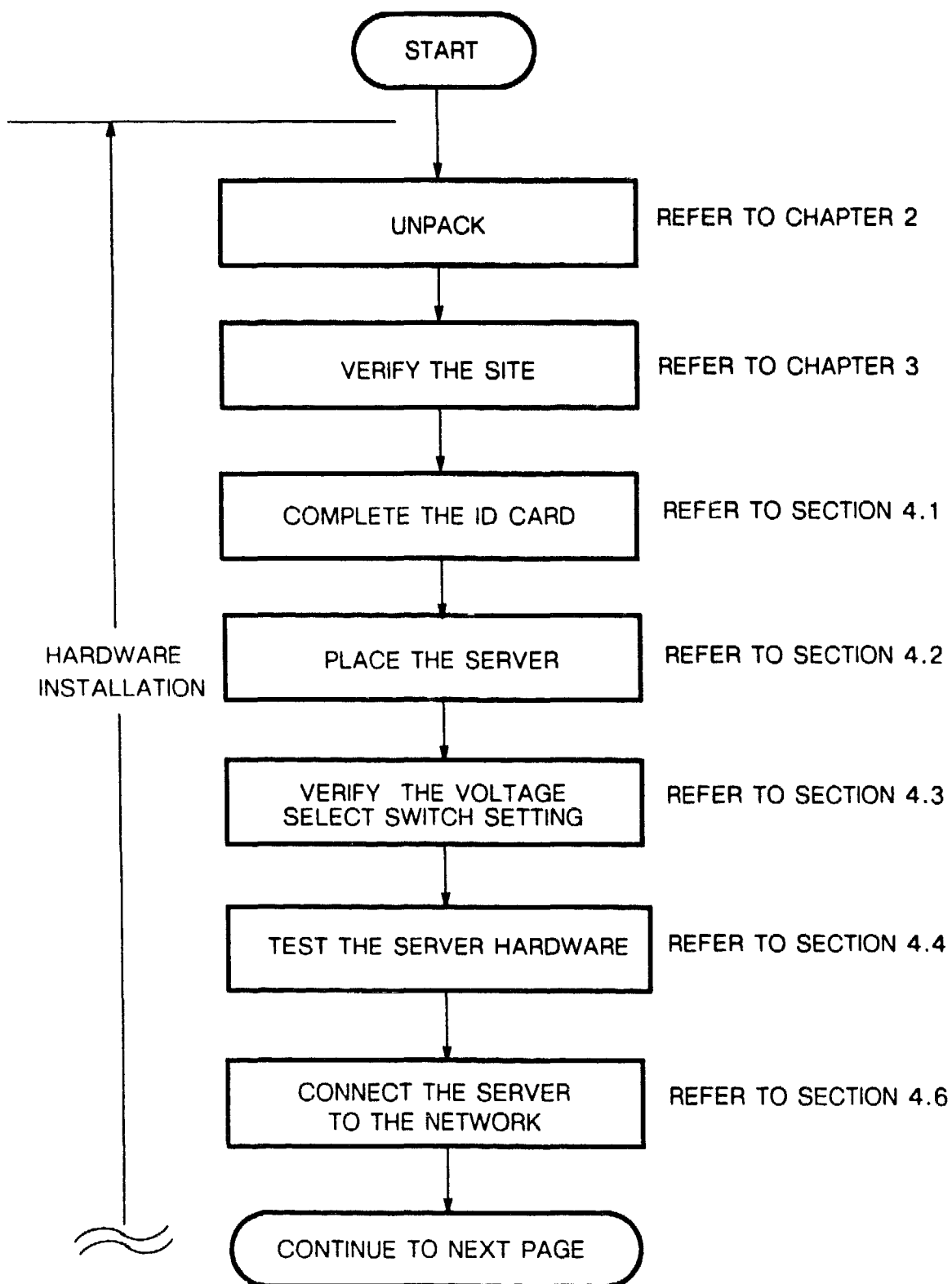
This chapter provides an overview of the system installation and of the DECserver 300 hardware. The procedure for installing the software and for verifying the system installation are contained in the *DECserver 300 Software Installation* manual.

NOTE

Connection to individual devices is not described in detail. Further information is can be found in Appendix C and in the *DECconnet System Planning and Configuration Guide*.

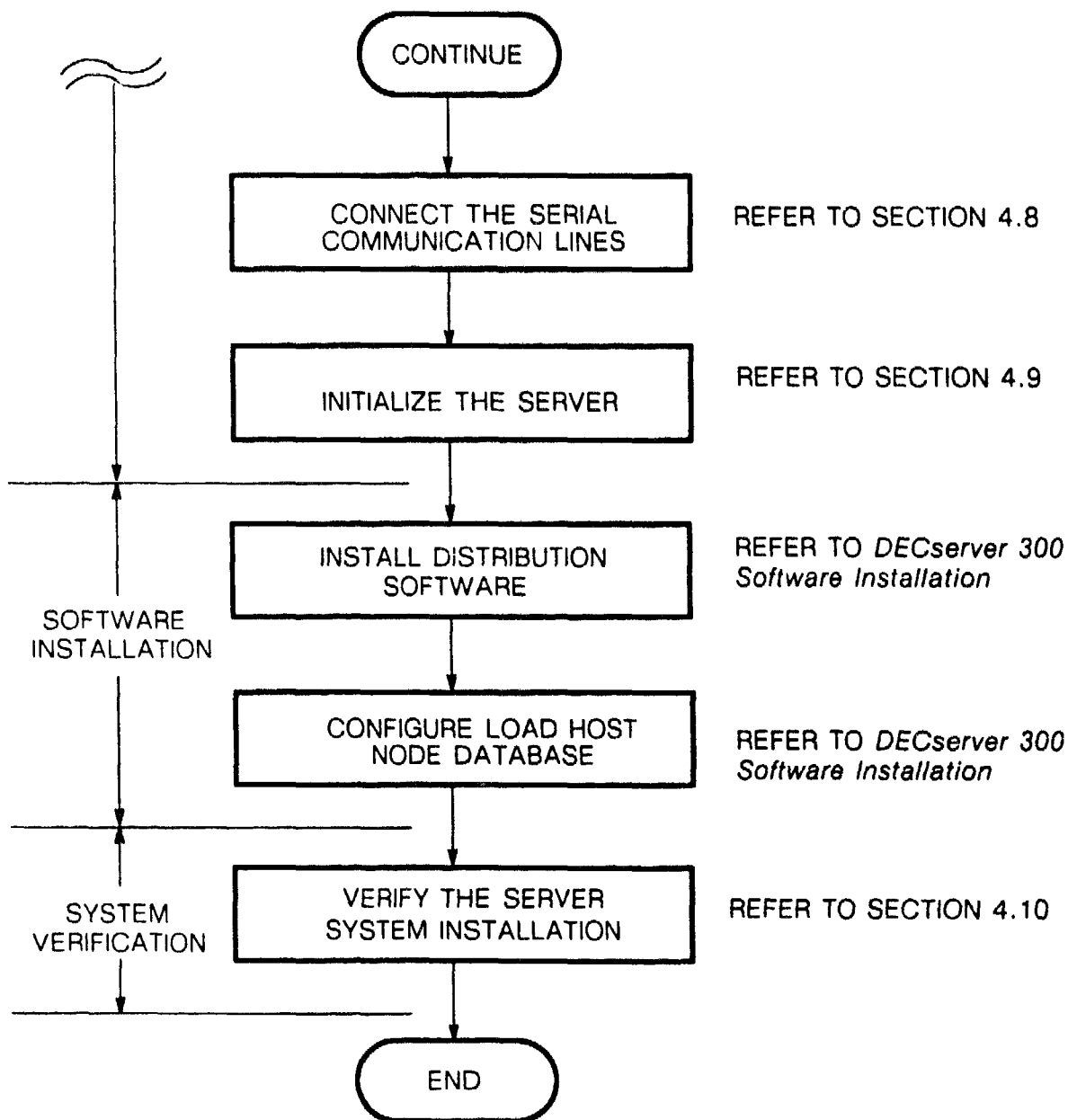
There is no prescribed order for installing the hardware and the software. The hardware is installed and tested without using the software. The software can be installed on a load host before or after the hardware is installed. However, the hardware and software must both be installed to verify the system installation. Figure 1-1 identifies the major steps that make up the total system installation.

Figure 1-1: DECserver 300 System Installation



LKG-2562-89

Fig 1-1 (Cont.): DECserver 300 System Installation



LKG-2563-89

1.2 Hardware Overview

The DECserver 300 is an Ethernet terminal server that allows devices (terminals, printers etc.) to communicate on an Ethernet LAN.

WARNING

Ethernet installations may extend to thousands of meters and couple hundreds of separate items of equipment. To prevent hazardous voltages appearing on the installation, it is important that all the equipment be part of a common equipotential system as defined in IEC publications 364-4-41 clauses 413.1.2 and 413.1.6. Where it is required to couple equipment outside of the main equipotential bonded area via Ethernet, then optical repeaters or other such galvanically isolated measures must be employed. If in doubt please refer to Digital Equipment Corporation for advice.

ADVARSEL

Ethernet-installationer kan strække sig over tusindvis af meter og forbinde hundredevis af separate dele af udstyr. For at undgå farlig spænding i installationerne er det vigtigt, at alt udstyret er del af et fælles jordingspunkt som defineret i IEC publikation 364-4-41, klausulerne 413.1.2 og 413.1.6. Hvor det er nødvendigt at forbinde udstyr udenfor det fælles jordingspunkt via Ethernet, skal der anvendes optisk kobling eller anden form for galvanisk isolering af udstyret. For yderligere oplysninger henvises til den lokale Digital afdeling.

VAROITUS

Ethernet-verkot voivat olla tuhansia metrej pitki ja niihin voidaan liitt satoja erilaisia laitteita. Jotta verkkoon ei psisi syntymn vaarallisia jnnitteit, kaikkien laitteiden on ehdottomasti kuuluttava samaan potentiaalintasausjrjestelmn, jonka ominaisuudet on mritetty IEC:n julkaisussa 364-4-41, kohdissa 413.1.2 ja 413.1.6. Mikli Ethernetiin halutaan liitt laite, joka ei kuulu potentiaalintasausjrjestelmn, on kytettv optisia toistimia tai vastaavia galvaanisesti eristettyj menetelmi. Jos et ole varma kytettvst menetelmst, ota yhteys Digitaliin.

DANGER

Une installation Ethernet peut s'tendre sur des kilomtres et relier des centaines d'lments. Afin d'viter tout problme lectrique, vrifiez la prsence d'une mise la terre commune ainsi qu'elle est dfinie par l'IEC (364.4.41, clauses 413.1.2 et 413.1.6). S'il s'avre ncessaire de relier par Ethernet des quipements non rattachs une mme terre, utilisez des rpteurs optiques ou autres matriels offrant la mme qualit d'isolation. En cas de doute, prenez contact avec les Services techniques Digital.

VORSICHT

Ethernet-Netzwerke knnen sich ber mehrere tausend Meter erstrecken und mehrere hundert einzelne Gerte miteinander verbinden. Zur Vermeidung von gefhrlichen Spannungen im Netzwerk ist es unbedingt erforderlich, da alle Gerte Teil einer gemeinsamen Erdungsschleife sind, wie in den IEC-Richtlinien 364-4-41, Abschnitte 413.1.2 und 413.1.6 angegeben. Wenn Gerte auerhalb der Erdungsschleife ber Ethernet miteinander verbunden werden mssen, mssen optische Repeater oder andere galvanisch getrennte Mittel verwendet werden. Falls Sie Fragen haben, wenden Sie sich an Digital Equipment.

WAARSCHUWING

Ethernet-configuraties kunnen een afstand van verschillende kilometers overbruggen en honderden afzonderlijke apparaten met elkaar verbinden. Om te vermijden dat er zich gevaarlijke spanningen zouden voordoen op de configuratie, is het belangrijk dat alle apparatuur gebruik maakt van dezelfde voeding en dezelfde aarde, zoals gedefinieerd in de IEC-publikatie 364-4-41, bepalingen 413.1.2. en 413.1.6. Wanneer apparatuur die niet op eenzelfde equipotentiaal spanningsnet is aangesloten via Ethernet gekoppeld moet worden, moet men gebruik maken van optische repeaters of van andere galvanisch isolerende technieken. Bij twijfel gelieve u contact op te nemen met Digital.

ADVARSEL

Ethernettinstallasjoner kan strekke seg over flere tusen meter og ha tilkoblet flere hundre forskjellige utstyrsenheter. For forhindre at det skal oppstå farlige spenninger på installasjonen, er det viktig at alt utstyret tilhører et felles ekvipotensialt forbindelsessystem, slik det er definert i IEC-publikasjon 364-4-41, paragrafene 413.1.2 og 413.1.6. Der hvor det er påkrevet koble utstyr via Ethernet utenfor det ekvipotensiale hovedområdet, er det påbudt benytte optiske linjeforsterkere (repeatere) eller tilsvarende galvanisk isolert materiale. Kontakt Digital hvis du er i tvil.

ATTENZIONE

Le installazioni Ethernet possono estendersi per migliaia di metri e collegare diverse centinaia di elementi separati di apparecchiature. Per evitare il rischio di scariche elettriche al momento dell'installazione, importante che tutte le apparecchiature siano collegate ad un comune sistema di massa come definito nella pubblicazione IEC 364-4-41, clausole 413.1.2 e 413.1.6. Laddove si richieda di collegare l'apparecchiatura fuori dalla principale area di massa via Ethernet, si devono utilizzare ripetitori su fibra ottica o qualsiasi altro strumento isolato galvanicamente. Per qualsiasi informazione rivolgersi alla sede Digital pi vicina.

AVISO

A instalao da Ethernet pode estender-se por milhares de metros e agrupar centenas de itens de equipamento.

Para evitar que voltagens perigosas surjam na instalao, importante que todo o equipamento faa parte de um sistema elctrico equipotencial comum, tal como definido na publicao 364-4-41 do IEC, clusulas 413.1.2 e 413.1.6.

Onde fr necessrio ligar equipamento fora da rea principal de ligao elctrica equipotencial, atravs da Ethernet, devero ser empregues repetidores pticos ou outras solues galvanicamente isoladas.

Em caso de dvida, contacte a Digital.

PRECAUCIN

Las instalaciones de Ethernet pueden extenderse hasta cientos de metros y a un gran nmero de equipos. Para evitar tensiones peligrosas en la instalacin, es importante que todos los equipos formen parte de un sistema equipotencial comn, tal y como se define en las publicaciones del IEC 364-4-41, clusulas 413.1.2 y 413.1.6. Cuando sea necesario conectar equipos a travs de Ethernet fuera del rea equipotencial principal, deben emplearse repetidores pticos u otros elementos aislados galvnicamente del mismo tipo. En caso de duda, le rogamos se ponga en contacto con Digital Equipment Corporation.

VARNING

Ethernet installationer kan vara tusentals meter och koppla ihop hundratala enstaka delar. Fr att undvika spnningsfara, r det viktigt att alla delar ingr i ett ekvipotentiellt system enligt definitionen i IEC publikationen 364-4-41, klausulerna 413.1.2 och 413.1.6. D det krvs att utrustning kopplas via Ethernet utanfr det ekvipotentiellasystemet, mste optiska frstrkare eller annan galvaniserad isolering anvndas. Vid eventuella oklarheter, kontakta Digital Equipment AB fr rdgivning.

א ד ה ר ה

התקנות ה-ETHERNET משתרעות לפעמים על פזי אלפי מטרים, והן עלולות לכלול כמה מאות פריטי ציוד זפרדים. כדי למצווע מתחים חשמליים שעלולים להיות סכנה במתקן, מאד חשוב להקפיד שכל הציוד יהווה חלק ממערכת חשמל משותפת הזמצאת באותו מבנה והמחברת בין מרכיביה, השווים בכח ובפוטנציאל, כפי שהוגדר ב-IEC, דבר דפוס 364-4-41 סעיפים 413.1.2 ו-413.1.6.

במקומות שבהם זדרש לחבר בין פריטי ציוד מחוץ למבנה הכולל את מערכת החשמל הראשית המשותפת, באמצעות ETHERNET, אזי חייבים להשתמש בציוד אופטי (OPTICAL REPEATERS, BRIDGES) או באמצעים אחרים המבודדים רצף מתכתי.

במידה ויתעוררו ספקות, זא לפנות למשרד דיגיטל הקרוב.

注 意

イーサネットの設置は数千メートルに及んだり、二、三百の設置項目（機器）に及ぶことがあります。

設置に際する危険な電圧の発生を防ぐためには、IEC公報364-4-41の条項413.1.2、および413.1.6に定められているように、すべての機器が共通接地システムに接続されていることが重要です。

共通接地システムに接続できない場所にイーサネットを介して機器を設置する必要がある場合、オプチカルリピータ、または電氣的に分離された手段を講じる必要があります。

ご不明な点は当社にお問い合わせ下さい。

The DECserver 300 hardware supports the EIA-423-A electrical interface standard. EIA-423-A is compatible with the EIA-232-D interface but supports longer cabling runs and higher signalling speeds. In addition, EIA-423-A minimizes damage to computing equipment caused by electrical overstress (EOS) and electrostatic discharges (ESD). EOS and ESD are the most common causes of communications equipment failure.

The DECserver 300 system allows any combination of 16 attached devices access to computer systems on a LAN via the port device connectors. Each device is connected to the computer systems and to their resources. The DECserver 300 system supports 16 asynchronous serial data communication channels and has both Thin-Wire and standard Ethernet interfaces.

The DECserver 300 system supports devices that require data-leads-only for operation. It has two additional signals, DSR and DTR, which may be used as follows:

- DSR Logout — Logs out an attached device on power-down
- DSR/DTR — Flow control for printers or other attached devices
- DSR — Status signal check for printers

NOTE

The DECserver 300 does not support connections to wide-area networks via modems, or connections to non-LAT hosts. Users requiring these capabilities should use the DECserver 200/MC which provides asynchronous modem support (both dial-in and dial-out), and uses the EIA-232-D interface.

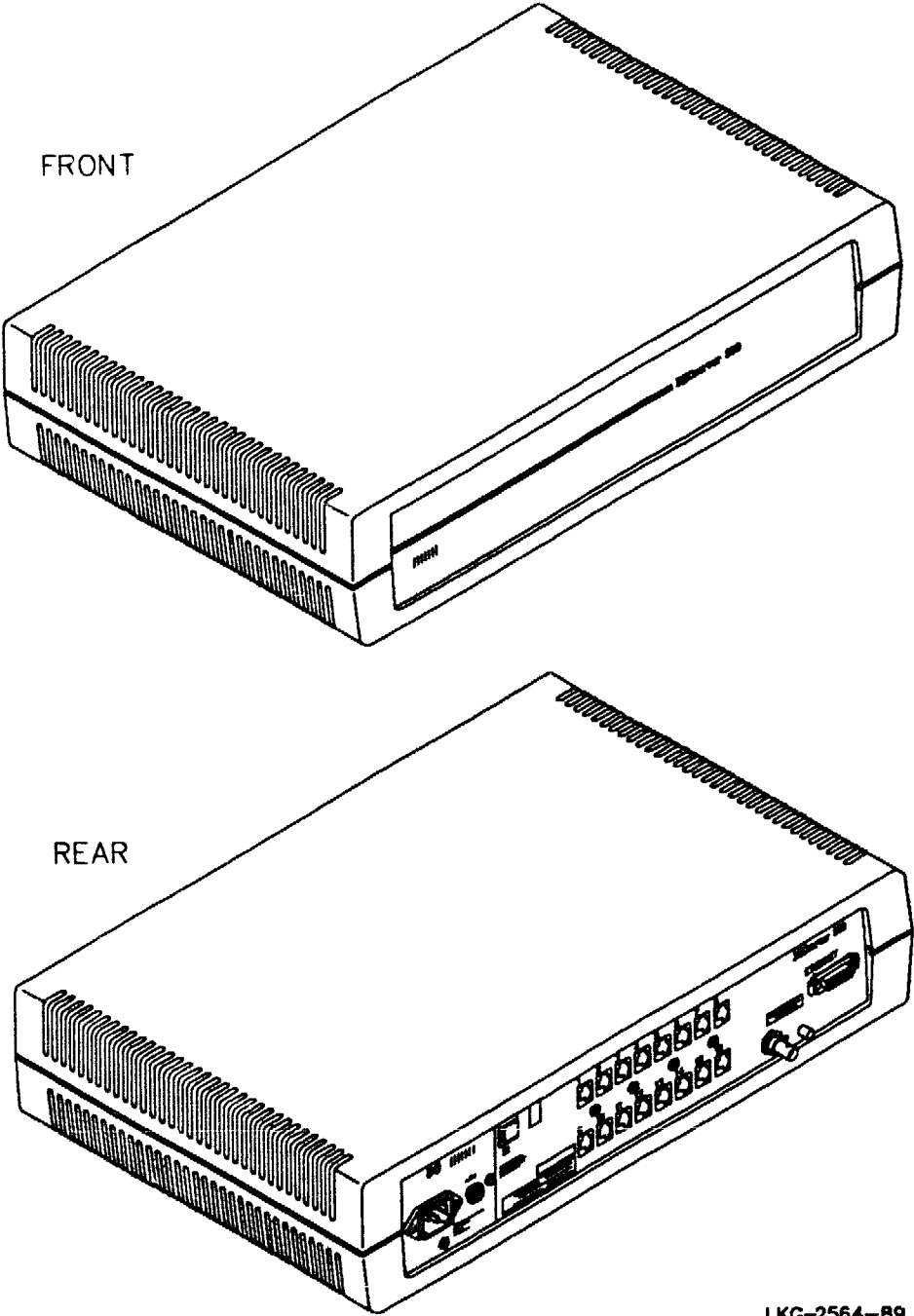
1.2.1 Models

There is only one model of the DECserver 300 (DSRVF-Bx) but this model has two versions depending on the input voltage as shown below .

Model Version	Input Voltage
DSRVF-BA	100-120 Vac
DSRVF-BB	220-240 Vac

The server is shown in Figure 1-2.

Figure 1-2: DECserver 300 Model DSRVF-Bx



LKG-2564-B9

1.2.2 Features of the DECserver 300

The DECserver 300 system offers the following features:

- Permits fast, easy connections between the devices attached to the server ports and the devices on the network
- Manages device traffic and allows computer systems more time for applications tasks
- Reduces and simplifies cabling required for connecting devices to a network
- Provides access to Digital Equipment Corporation host systems on the Local Area Transport (LAT) network

1.2.3 Server Controls, Indicators, and Connectors

All of the server controls, indicators, and connectors that are used during server operation are located on the rear of the server and are shown in Figure 1-3.

The server controls are described in Table 1-1. The indicators are described in Table 1-2 and a brief description of the connectors is given in Table 1-3. (Further information on the connectors and associated cables is given in Chapter 4 and Appendix A.).

Figure 1-3: DECserver 300 Back Panel

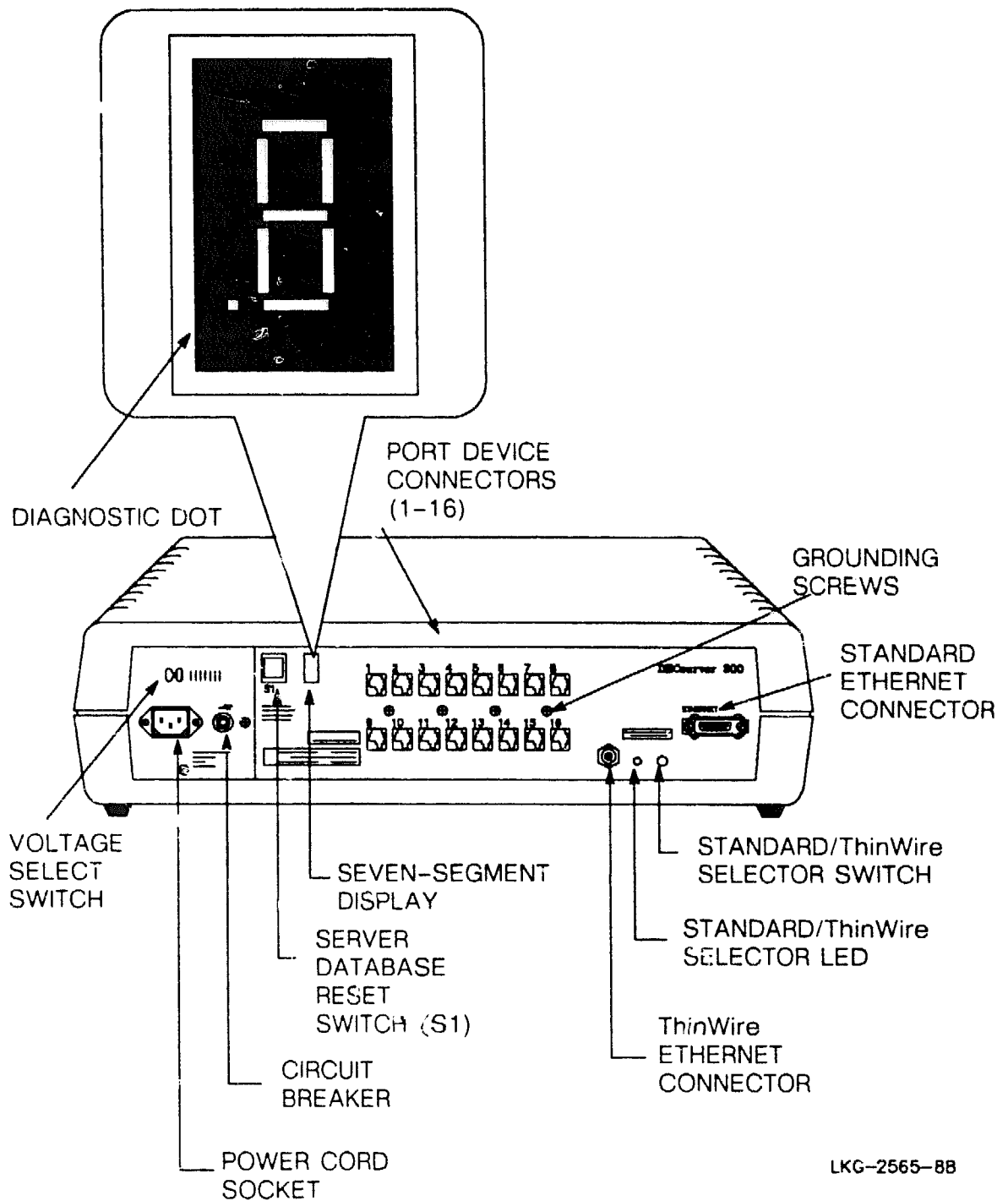


Table 1-1 : Server Controls

Control	Description
Server database reset switch (S1)	This switch, in conjunction with power-up, restores factory-set parameters in the server's database.
Voltage select switch	This switch sets the input voltage to the range required (100-120Vac or 220-240Vac).
Circuit breaker	A circuit breaker (press to reset) protects the power supply against excessive current.
Standard/ThinWire selector switch	This switch selects either ThinWire or Standard Ethernet.

Table 1-2 : Server Indicators

Indicator	Display
Standard/ThinWire selector LED	Lights (green) to indicate that the ThinWire Ethernet connector is selected.
Seven-Segment Display	This display provides error and status information (See Chapter 5 for further details).
Diagnostic Dot	The decimal point on the display provides diagnostic information (See Chapter 5 for further details).

Table 1-3 : Server Connectors

Connector	Description
Port device connectors	These are sixteen, 6-Pin female modified modular jack (MMJ) connectors used to connect devices to the server.
Standard Ethernet connector	This single 15-pin female D-connector is used to connect to a standard Ethernet local area network using transceiver cable.
ThinWire Ethernet connector	This single female BNC connector is used to connect to a ThinWire Ethernet local area network using ThinWire cable and a T connector.
Power cord receptacle	The server power cord plugs into this receptacle.
Grounding screws	These screws provide grounding points for shielded cables

1.3 Software Requirements

The software requirements for installing and operating the DECserver 300 are as follows:

- DECserver 300 distribution software — Installed on each DECserver 300 system load host.
- DECnet Phase IV software — Installed on each DECserver 300 system load host (not required for ULTRIX systems).
- LAT service node software — Installed on all LAT service nodes that communicate with DECserver 300s and their devices.

You must install the distribution software on a load host that runs DECnet Phase IV software. The distribution software includes a server image file that is down-line loaded to a DECserver 300. The load host down-line loads the server image whenever required, and provides the server image to any number of servers. The server image, running on the DECserver 300, constitutes the server software that enables the server to perform its functions. The server software implements the LAT architecture on the DECserver 300.

The service node software supports the LAT architecture and must be installed on each service node. The LAT software is packaged with each of the following operating systems:

- VMS operating systems
- ULTRIX-32 operating system

All software must be installed and verified before you can operate the server.

For more information, see the *DECserver 300 Software Product Description* that applies to each specific operating system.

1.4 Service Options

The following sections briefly describe the Digital Equipment Corporation hardware and software options that are available for the DECserver 300 system. For more information, please contact your Digital sales representative.

1.4.1 Digital On-Site Service

Digital provides on-site service under a service agreement or on a per-call basis. Trained service specialists perform hardware maintenance at your site.

1.4.2 DECmailer

DECmailer allows you to ship the server to a Customer Return Center for repair.

1.4.3 Installation Service

Installation service includes services provided by trained service specialists for successful installation of your DECserver 300 system.

1.4.4 Software Product Service Agreements

Digital offers software product service agreements to support your software.

1.4.5 Training

Digital Educational Services sells training for installation, maintenance, and management of Digital software. Course formats may vary from seminars to packaged training materials.

Unpacking the Boxes

2.1 Number of Boxes in Shipment

A single DECserver 300 hardware shipment consists of one or more boxes, depending on the equipment ordered. Check each box for damage.

- **IN CASE OF DAMAGE**

- Stop unpacking.
- Contact your Digital Equipment Corporation sales representative.

- **IF PARTS ARE MISSING**

- Identify missing parts.
- Contact your Digital Equipment Corporation sales representative.

NOTE

Save the box and packing material in case you need to return the unit.

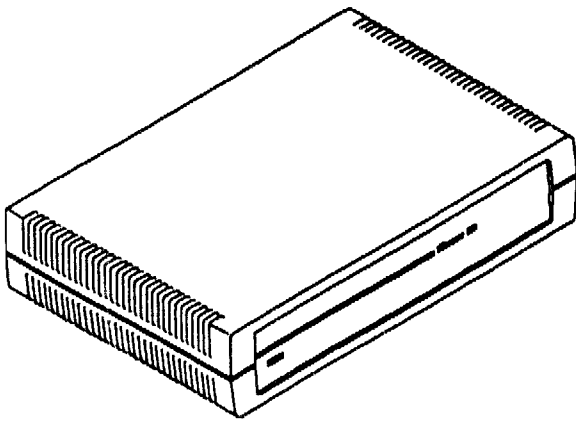
2.2 Contents of DECserver 300 Hardware Shipment

Check the shipment for the items shown in Figure 2-1.

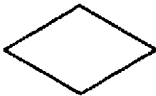
NOTE

The order number DSRVF-BA includes the country kit for the U.S.A. The order number DSRVF-BB does not include a country kit (see Appendix D for details).

Figure 2-1: Contents of the DECserver 300 Hardware Shipment



- Software license



- BNC T-connector



- BNC 50-ohm terminators (2)

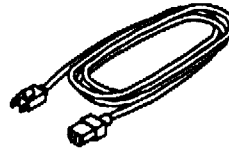


- H3103 loopback connector

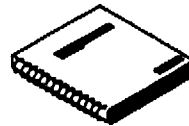


COUNTRY KIT

- Power Cord



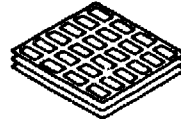
- *DECserver 300
Hardware Installation*



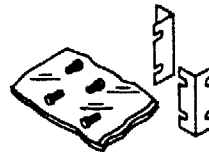
- *DECserver 300
Identification Card*



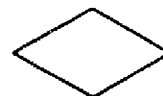
- Blank ID labels for cables



- Rack mount kit



- FTZ card
(Austria and Germany only)



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Site Verification

This chapter provides information for verifying that the preselected installation site meets the server's physical, environmental, electrical, and network cabling requirements.

The instructions in this chapter assume that the customer has completed the following site preparation requirements:

- A server installation site is identified.
- An appropriate ac power source is within 1.8 meters (6 feet) of the server.
- The network connection is arranged to a preinstalled Ethernet device.

3.1 Verifying Hardware and Cable Requirements

The server can operate in an office environment and in a standard equipment rack located in a computer room or satellite equipment room. Regardless of where the server will be installed, you must verify that all of the requirements in this section are met before beginning the installation.

3.1.1 Physical Requirements

The DECserver 300 hardware should be placed at least 45 centimeters (18 inches) above the floor. Allow for 15 centimeters (6 inches) of airspace around the server air vents. Table 3-1 shows the size and weight of the server.

Table 3-1: Physical Specification of the Server

Dimension	Measurement
Width	49.3 cm (19.4 inches)
Height	11.7 cm (4.6 inches)
Depth	31.2 cm (12.3 inches)
Weight	5.4 kg (11.9 lbs)

3.1.2 Environmental Requirements

Environmental requirements for temperature and humidity must be within the ranges shown in Table 3-2.

Table 3-2: Environmental Specifications of the Server

Parameter	Minimum	Maximum
Temperature †		
Operating	5°C (41°F)	50°C (122°F)
Nonoperating	-40°C (-40°F)	66°C (151°F)
Maximum temperature changes per hour	-	20°C (36°F)
Altitude		
Operating		2438 meters (8000 feet)
Nonoperating		4877 meters (16000 feet)
Relative Humidity		
Operating (noncondensing)	10%	95%
Nonoperating (noncondensing)	10%	95%

† If you are operating the server above 2.4 kilometers (8000 feet), decrease the operating temperature specification by 1.8°C for each 1000 meters (1°F for each 1000 feet).

3.1.3 Electrical Requirements

The power at the electrical outlet must match the requirements shown in Table 3-3.

Table 3-3: Electrical Requirements

Requirement	DSRVF-BA	DSRVF-BB
Voltage range	100-120 Vac (3-wire, single phase)	220-240 Vac
Frequency	50 to 60 Hz	50 to 60 Hz
Line current	1.0 A	0.5 A
Power	75 W	75 W

3.1.4 Leakage Current

The DECserver 300 hardware leakage current is shown in Table 3-4.

Table 3-4: Leakage Current

Parameter	DSRVF-BA	DSRVF-BB
Voltage range	100-120 Vac (3-wire, single phase)	220-240 Vac
Frequency	50 to 60 Hz	50 to 60 Hz
Leakage Current	0.68 mA	0.86 mA

Note

The values in Table 3-4 are not a specification and therefore should be used only as a guide.

3.1.5 Cabling Requirements

The cabling requirements of the server are shown in the following sections. Further information on cabling and configuring of local area networks, and using DECconnect System products, is provided in the *DECconnect System Planning and Configuration Guide*. Table 3-5 shows the maximum cabling distances for different types of cable used between the server and transceiver, and also the maximum length of power cable. Table 3-6 shows the maximum cabling distances for BC16E cable using different line speeds and formats.

Table 3-5: Maximum Cabling Distances

From	To	Maximum Distance	Cable Type
Server	Transceiver	50 meters (164 feet)	BNE3x-xx standard transceiver cable
Server	Transceiver	12.5 meters (41 feet)	BNE4x-xx office transceiver cable
Server	Power outlet	1.8 meters (6 feet)	Server power cable
Server †	DESPR/DEMPR	185 meters (606 feet)	H8243-A cable

† No other device in ThinWire segment.

Table 3-6: Maximum Cabling Distances — Server to Devices

From	To	Line Speed	Maximum Distance	Cable Type
Server ¹	RS423/ EIA-423-A device	4.8 Kb	1200 meters (4000 feet)	H8245 or H8246 (24 AWG, 4 pair, twisted pair)
		9.6 Kb	900 meters (3000 feet)	
		19.2 Kb	300 meters (1000 feet)	
Server ¹	EIA-232-D device	4.8 Kb	75 meters (250 feet) ²	24 AWG, twisted pair
		9.6 Kb	75 meters (250 feet) ²	
		19.2 Kb	15 meters (50 feet) ²	
Server ¹	EIA-232-D device	4.8 Kb	15 meters (50 feet) ²	BC16E
		9.6 Kb	15 meters (50 feet) ²	
		19.2 Kb	15 meters (50 feet) ²	

¹ If it is necessary to use shielded cables, then the maximum distances must be de-rated because of increased cable capacitance. In such situations Digital recommends that 50 feet be considered the maximum.

² May be extended by using the H3105 active adapter.

3.1.5.1 Standard Ethernet Connection

The transceiver cable must reach the server and must not exceed the maximum distances listed in Table 3-5. Table 3-5 identifies the maximum communications distances that can be achieved using certain types of cables.

3.1.5.2 ThinWire Ethernet Connection

The ThinWire cable segment must conform to the following configuration rules:

- The maximum cable segment length must not exceed 185 meters (606 feet).

- There must be a 50-ohm terminator at each end of the cable segment unless the cable ends in a DEMPR or DESPR. (Both these devices have built-in 50-ohm terminators).
- There must be only one ground cable per segment.
- There must be at least 0.5 meter (19 inches) between T-connectors.
- The maximum number of stations, between terminators, must not exceed 30.
- ThinWire cable segments must never be configured in a loop.
- ThinWire cable segments must never have any branch segments.

3.2 Preinstallation Checks

Before beginning the server installation, use the following checklist to make sure that the site preparation is complete.

3.2.1 Hardware Checks

- Arrangements have been made to connect the server Ethernet port to an Ethernet interface device. For Standard Ethernet, the device can be a DELNI network concentrator or an Ethernet transceiver. For ThinWire Ethernet, the device can be a DEMPR or a DESPR.
- The Ethernet interface device is installed and the required cabling is in place, tested, and tagged.
- The wall/partition mounting bracket kit or rack mount kit is installed (if required) as described in the kit documentation.
- Cables of appropriate length are available for connecting the server to the Ethernet interface device.
- The devices (terminals, printers, personal computers, and hosts) are ready to be connected.
- One terminal (asynchronous, EIA-423-A or EIA-232-D compatible) is available for hardware testing and system verification.

3.2.2 Software Checks

- The *DECserver 300 Identification Card* was filled out (as described in Section 4.1) and given to the system manager.
- The system manager installed or will install the server software on the load host.

- The system manager installed or will install the LAT service node software (if required).
- DECnet Phase IV is installed and running on each load host.

Hardware Installation

This chapter provides procedures for installing the hardware and for verifying the server system installation.

4.1 Completing the Server Identification Card

Locate the *DECserver 300 Identification Card*, included in the server box, and copy the following information in the spaces provided on the card:

- The server's serial number. The serial number is located on the back of the server.
- The server's Ethernet address. The Ethernet address is located on the back of the server.
- The location of the server, such as an office location, building number, or floor.
- Your name and the date of installation.

4.2 Placing the Server

You can install the DECserver 300 system in a variety of environments, including offices and computer rooms, as long as the environmental specifications are met. The server can be placed on a desk or table, or can be mounted in a standard rack cabinet. Digital can also provide you with a wall/partition mounting bracket to mount the server directly onto an office wall or to suspend the server from partitioned office walls. This bracket must be ordered separately. See Appendix D for ordering information.

4.2.1 Placing the Server in an Office

The DECserver 300 hardware should be placed at least 45 centimeters (18 inches) above the floor. Allow for 15 centimeters (6 inches) of airspace around the server air vents.

4.2.2 Rack Mounting the Server

If you wish to mount the server in a rack, do the following:

WARNING

The following procedure involves the removal of the system covers and should be performed only by trained service personnel.

ADVARSEL

Flgende procedure involverer fjernelse af kabinettet og br kun udfres af uddannet servicepersonale.

VAROITUS

Seuraava toimenpide edellytt laitteiston kansien avaamista, ja sen suoritus on jtetty koulutetun yllpitohenkilkunnan huoleksi.

ATTENTION

Faites appel du personnel qualifi pour effectuer l'opration dcrite ci-aprs.

WARNUNG

Fr das folgende Verfahren mssen erst die Abdeckungen des Systems entfernt werden. Dies sollte nur von Servicespezialisten durchgefhr werden.

WARNUNG

Fr das folgende Verfahren mssen erst die Abdeckungen des Systems entfernt werden. Dies sollte nur von Servicespezialisten durchgefhr werden.

WAARSCHUWING

De volgende procedure omvat het verwijderen van de systeempanelen en moet alleen door getraind service-personeel worden uitgevoerd.

ATTENZIONE:

La seguente procedura si riferisce alla rimozione degli involucri, e deve essere attuata esclusivamente da personale qualificato.

ADVARSEL

Fremgangsmten nedenfor medfrer at system-dekslene m fjernes. Dette m bare utfres av kvalifiserte fagfolk.

AVISO

O procedimento seguinte envolve a remoo das coberturas do sistema, a qual s deve ser efectuada por pessoal devidamente qualificado.

PRECAUCIN

El siguiente procedimiento conlleva la retirada de las cubiertas del sistema, y debe llevarlo nicamente a cabo personal del servicio tcnico.

VARNING

I nedanstende anvisningar ingr borttagning av systemkpor, vilket endast fr utfras av utbildad servicepersonal.

אזהרה

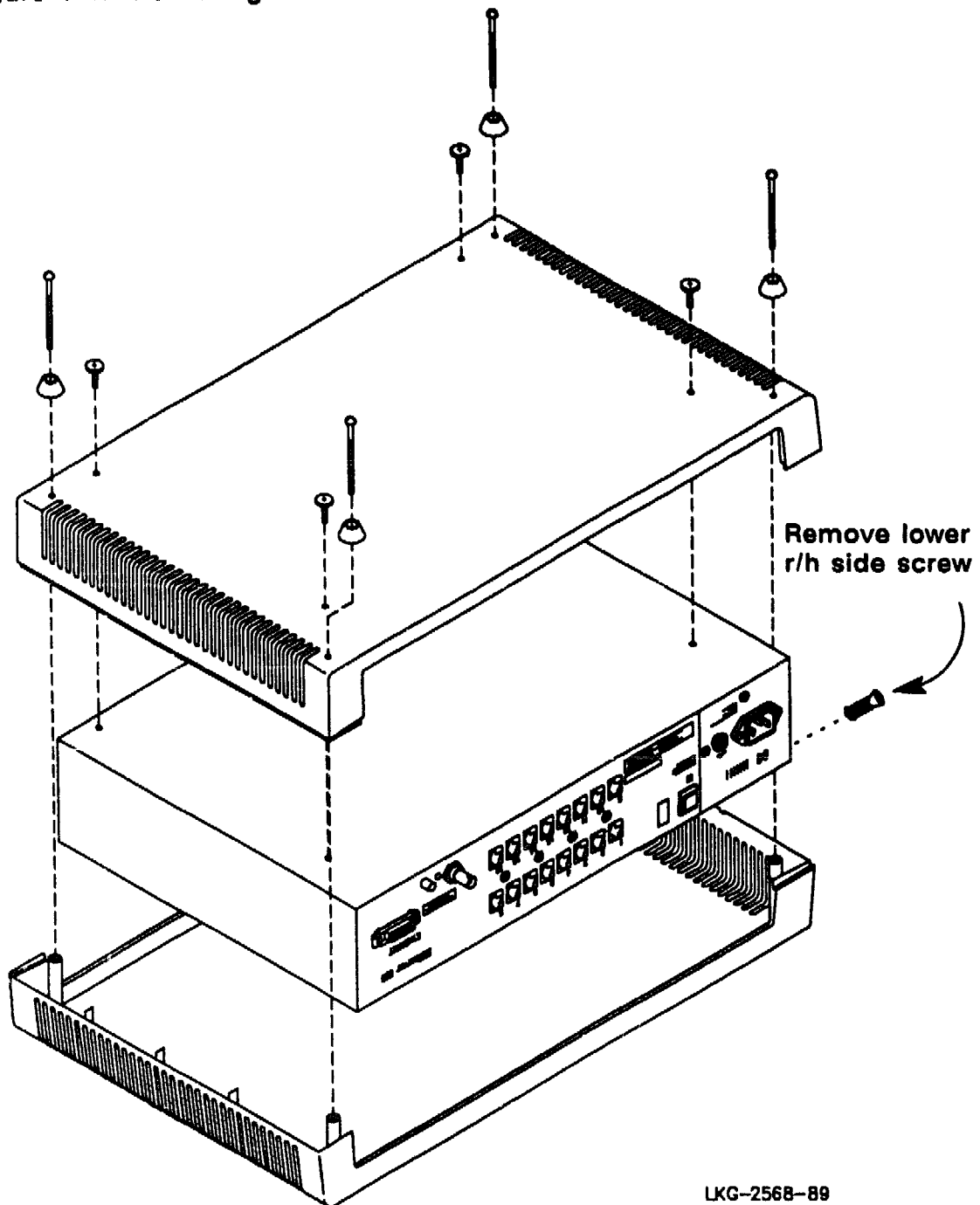
התהליך הבא מחייב הסרת מכסי המערכת, והוא חייב להתבצע על ידי טכנאי השרות המקצועיים של דיגיטל.

注意

これから述べる手順には、本体カバーの取り外し作業が含まれているため、必ず、弊社のサービス担当者にご依頼ください。

1. Turn the server upside down.
2. Remove the covers (see Figure 4-1).
3. Rack mount the server by following the instructions in Figure 4-2.

Figure 4-1: Removing the Covers

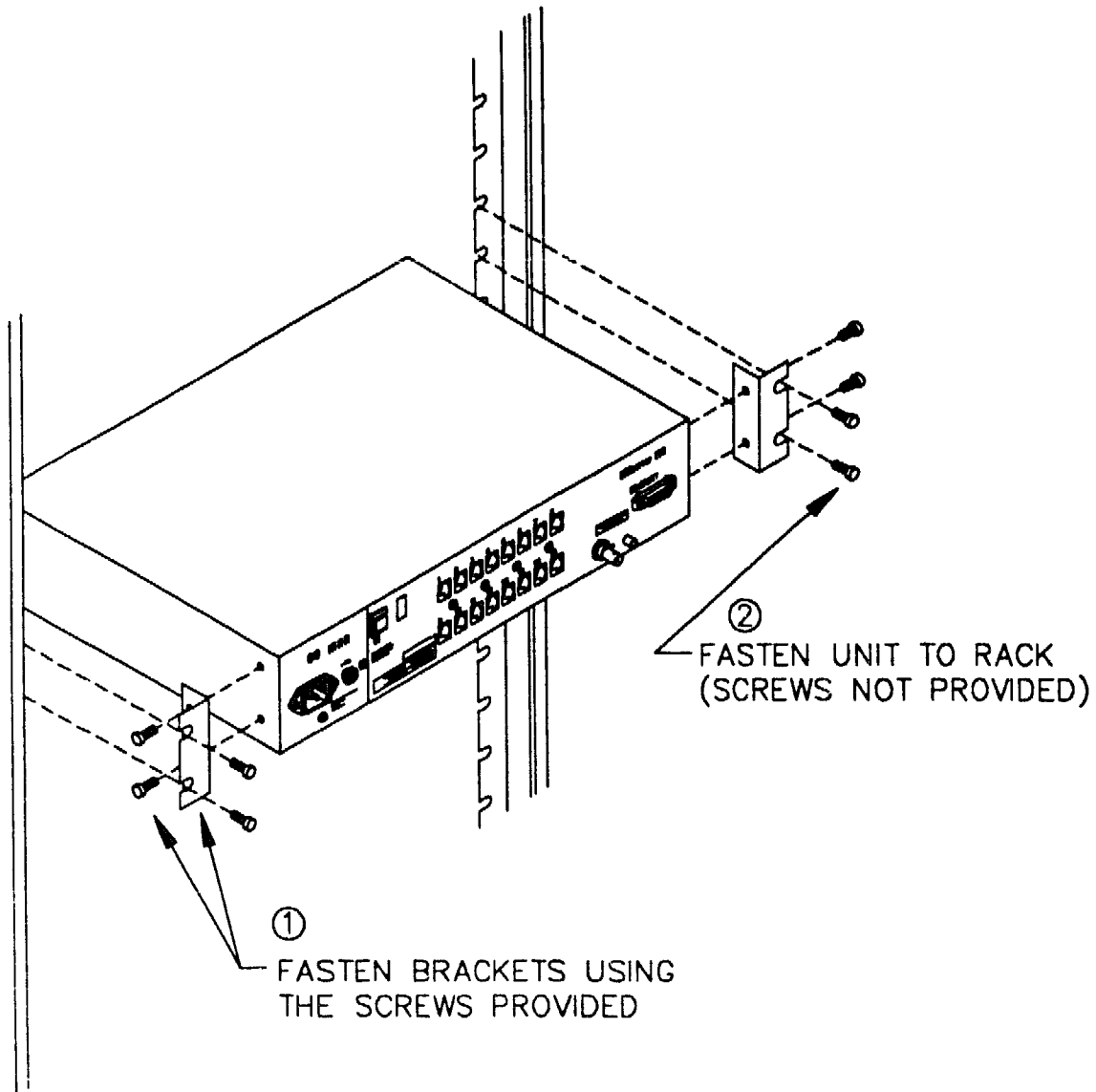


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Note

When covers have been removed, *do not* re-insert cover screws.

Figure 4-2: Rack Mounting the Server



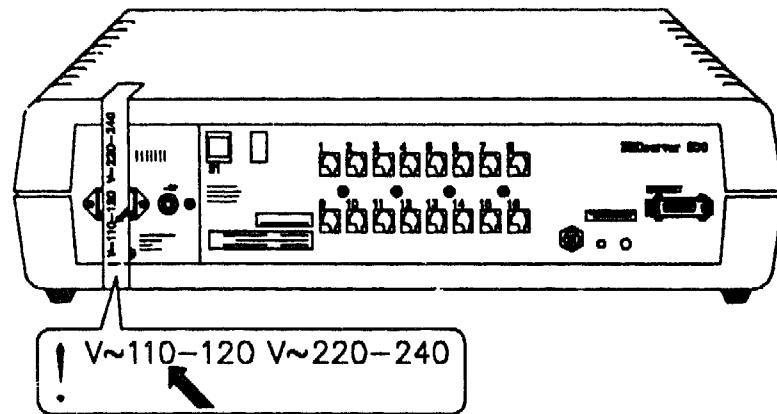
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4.3 Verifying the Voltage Select Switch Setting

To verify or change the voltage select switch settings do the following:

1. Locate the removable voltage label (see Figure 4-3).

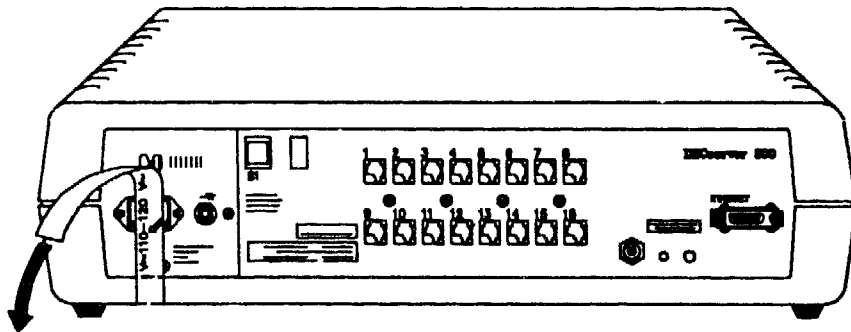
Figure 4-3: Locating the Voltage Label



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2. Remove the voltage label (see Figure 4-4).

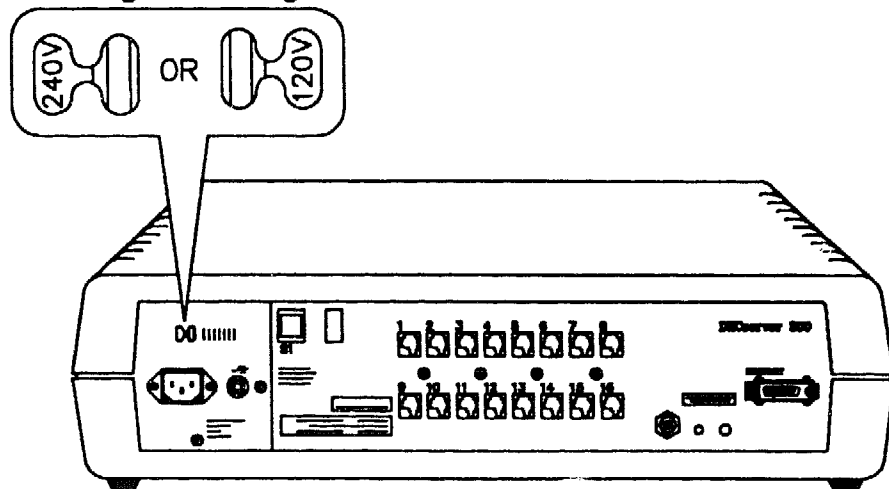
Figure 4-4: Removing the Voltage Label



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3. Check the voltage select switch (see Figure 4-5).

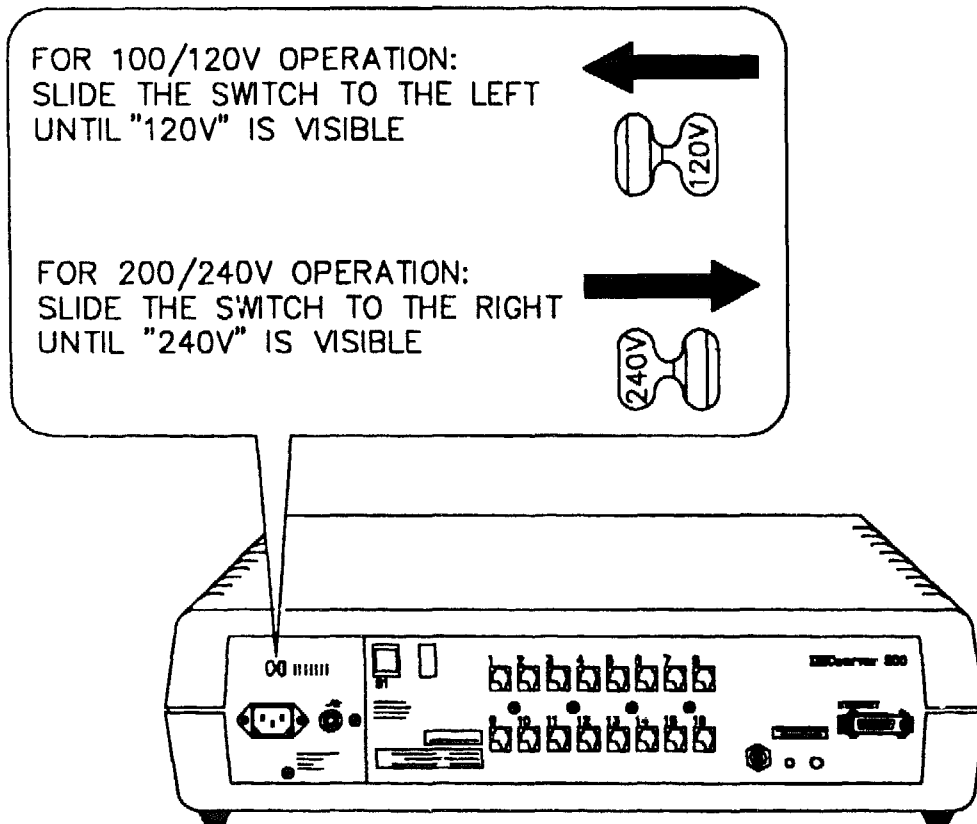
Figure 4-5: Checking the Voltage Select Switch



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4. If necessary, adjust the voltage select switch (see Figure 4-6).

Figure 4-6: Adjusting the Voltage Select Switch



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4.4 Testing the Server Hardware

The server hardware should be tested before being connected to the local area network (LAN). The procedure is:

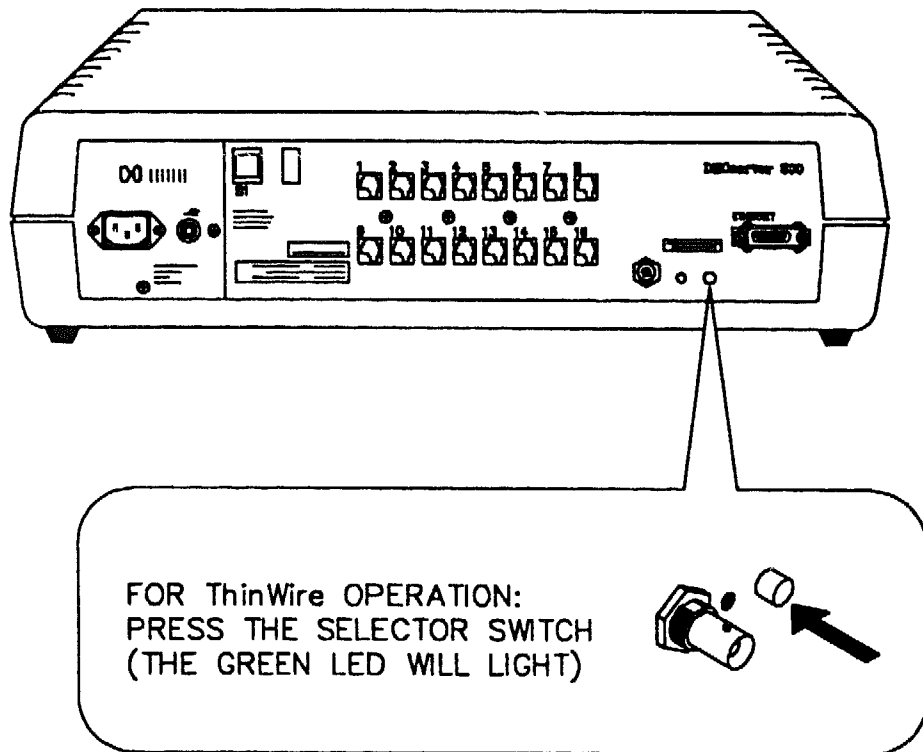
1. Select the ThinWire Ethernet.
2. Connect the T-connector and terminators.
3. Connect power to the server.
4. Run self-test.

These steps are explained in the following sections.

4.4.1 Selecting ThinWire Ethernet

To select ThinWire Ethernet, press the selector button. The switch will remain in, and the green LED will light when power is supplied to the server (see Figure 4-7).

Figure 4-7: Selecting ThinWire Ethernet

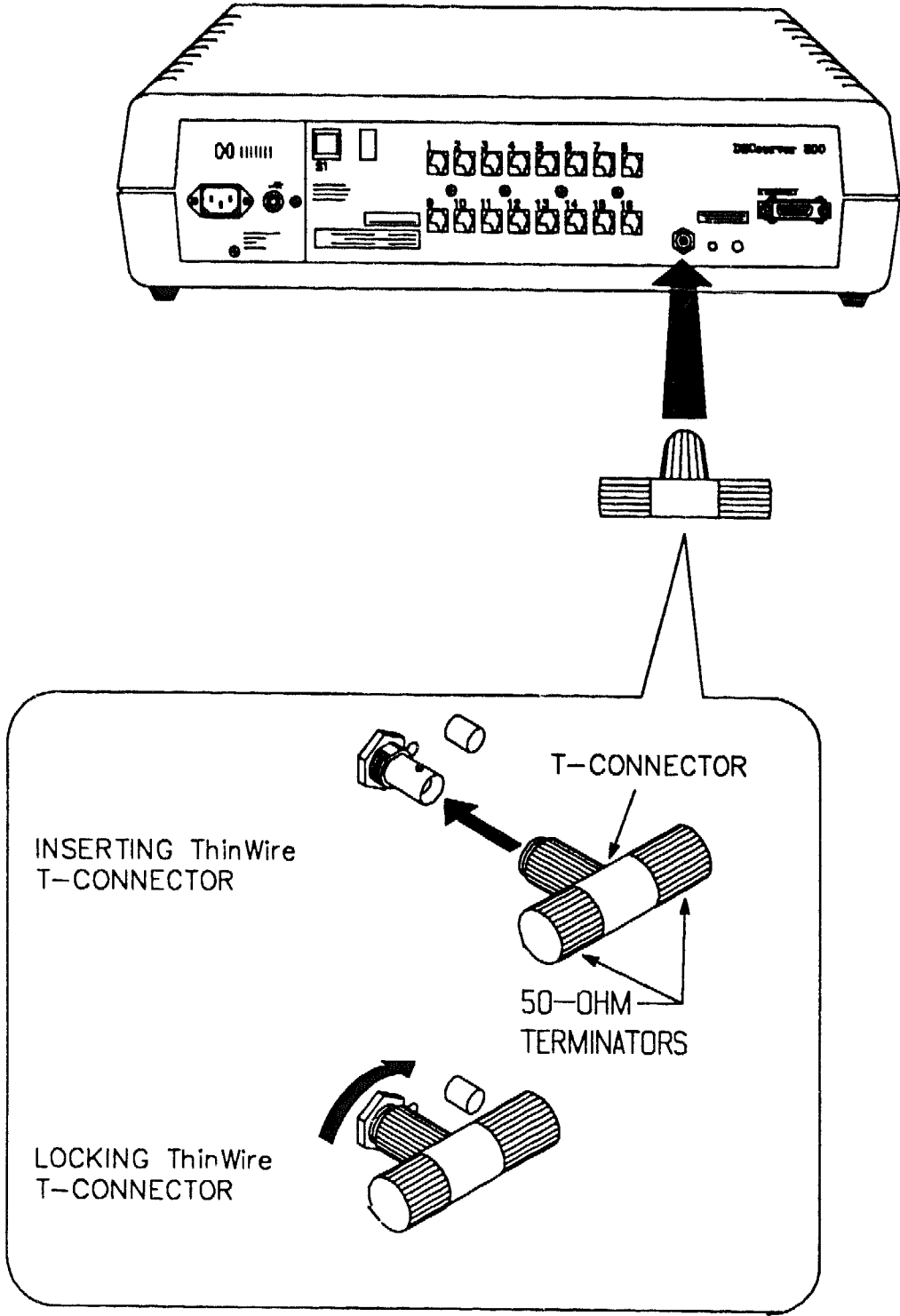


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4.4.2 Connecting the ThinWire T-Connector and Terminators

Insert the 50 ohm terminations into the T-connector and insert the T-connector into the BNC connector at the rear of the server. Turn the barrel of the connector clockwise to lock (see Figure 4-8).

Figure 4-8: Connecting the ThinWire T-Connector and Terminators

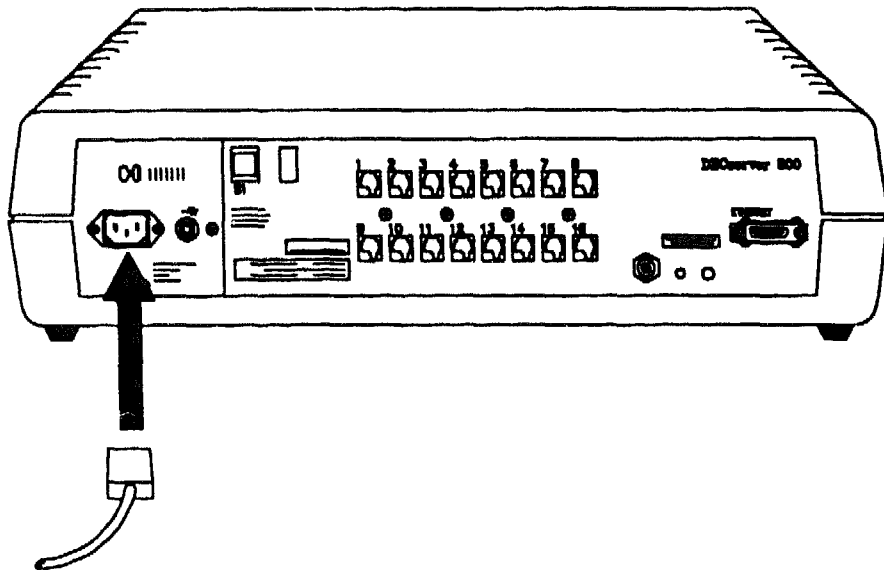


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4.4.3 Connecting Power to the Server

To connect power to the server, insert the power cord into the connector (see Figure 4-9). Insert the mains plug into a power socket.

Figure 4-9: Connecting Power to the Server

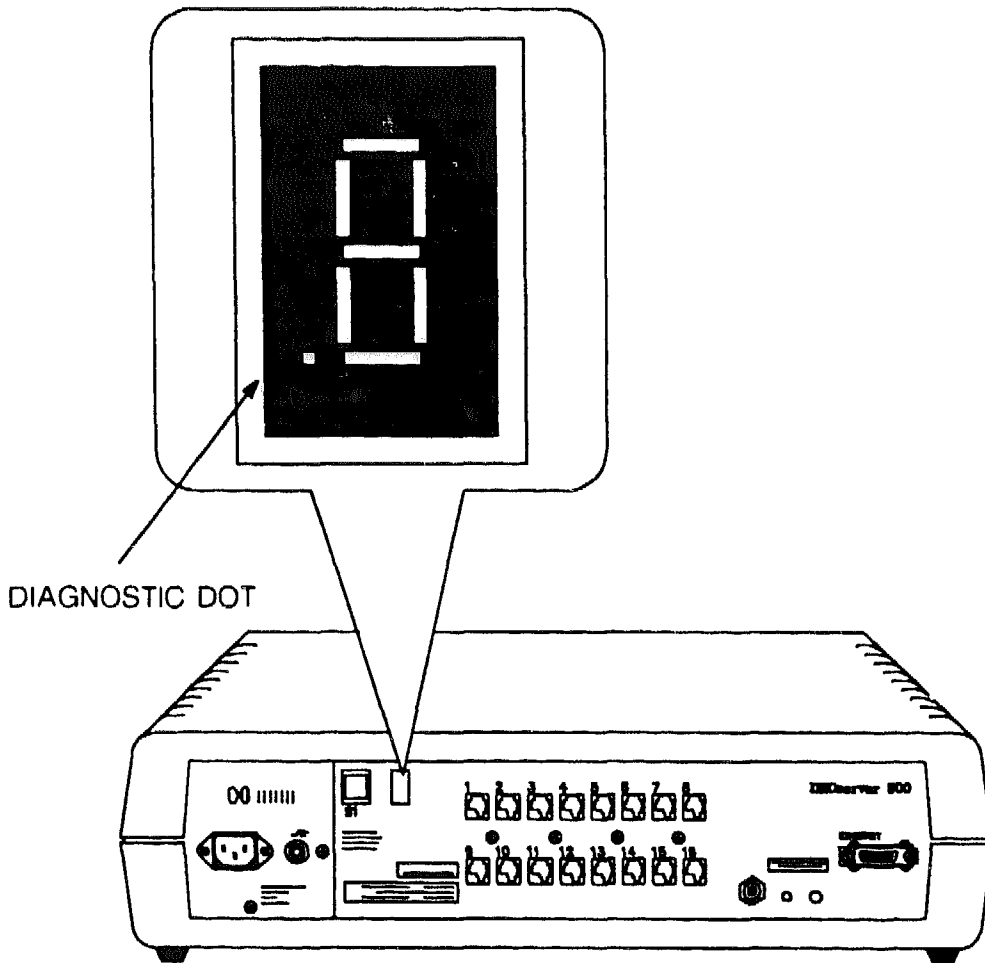


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4.4.4 Running Self-Test

Plugging in the server power cord applies power directly to the server and starts self-test. The seven-segment display and diagnostic dot (decimal point) supply diagnostic and status information. Figure 4-10 shows the seven-segment display and diagnostic dot. Table 4-1 shows the seven-segment display codes and Table 4-2 explains the diagnostic dot display.

Figure 4-10: The Seven-Segment Display



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When the server power cord is plugged in, the seven-segment display shows an "8", and the diagnostic dot is on, for approximately 0.5 seconds as a display check. The diagnostic dot is turned off as self-test starts and the display counts down from "F" through "5" as each block of tests is executed. If a fatal error is detected, testing stops and the DECserver display flashes the code corresponding to the failing test. If a nonfatal error is detected testing continues and the diagnostic dot blinks. (See Chapter 5 for what action to take).

NOTE

There is one exception to this sequence. If the server fails the Ethernet subsystem external loop-back test, the display stops at "9" and the diagnostic dot blinks. The "9" on the display does not blink.

When the server passes self-test, it attempts to load the server software from the host and will display the appropriate code(s) (see Table 4-1). At any time after self-test execution, power down the server, disconnect the T-connector and terminators, and continue with the installation.

Table 4-1 explains the seven-segment display codes. Table 4-2 explains the diagnostic dot display.

Table 4-1: Seven -Segment Display Codes

Display	System Status
F	Bootstrap tests executing
E	RAM subsystem test executing
d	Interrupt subsystem tests executing
C	Timer tests executing
b	ROM subsystem tests executing
A	Ethernet subsystem tests executing (internal loopback)
9	Ethernet subsystem external loopback test executing
7	Asynch subsystem tests executing (internal loopback)
5	System exerciser tests executing
4	Requesting load
3	Load request backoff
2	Loading
1	Requesting dump
0	Dumping
(Rotating segment) †	Server software executing

† Segment rotates, outlining a "figure of eight" pattern

Table 4-2: Diagnostic Dot Display

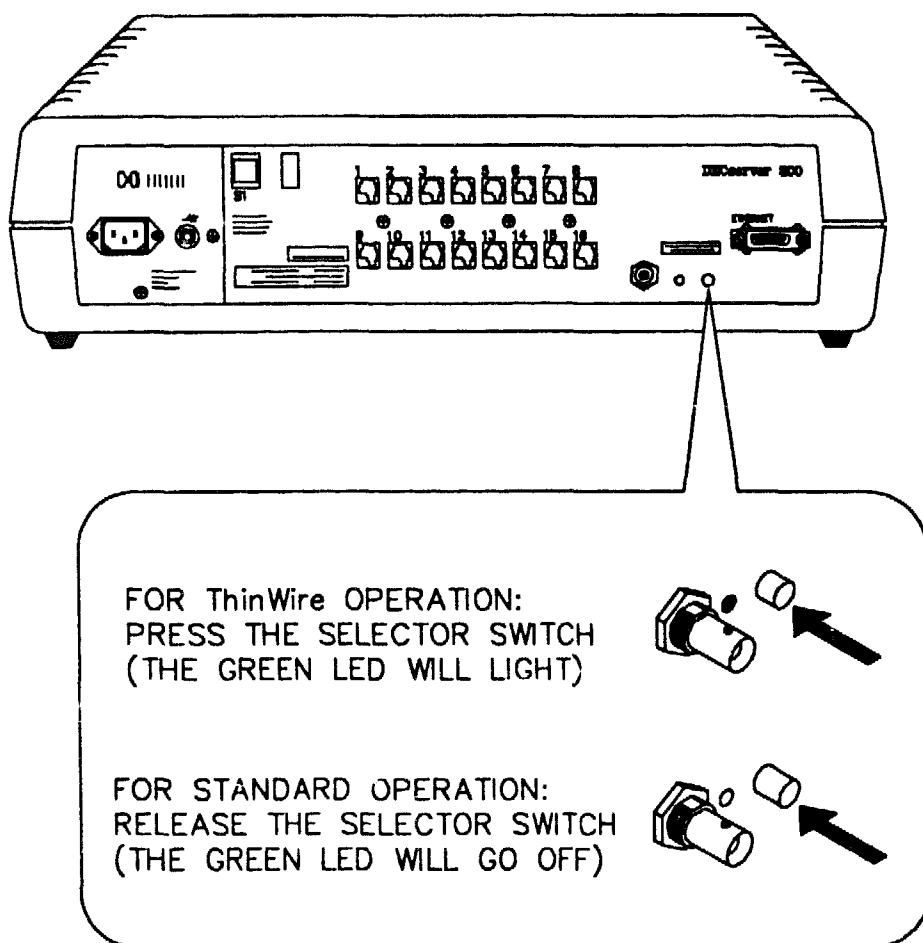
Diagnostic Dot	System Status
On	No fatal errors
Off	Fatal error or self-test in progress
Blinking	Non-Fatal error detected

4.5 Selecting the ThinWire or Standard Ethernet LAN

To select ThinWire Ethernet, press the selector button. The switch will remain in and the green LED will light when power is supplied to the server (see Figure 4-11).

To select standard Ethernet, release the selector button. The green LED will go out (see Figure 4-11).

Figure 4-11: Selecting Standard or ThinWire Ethernet



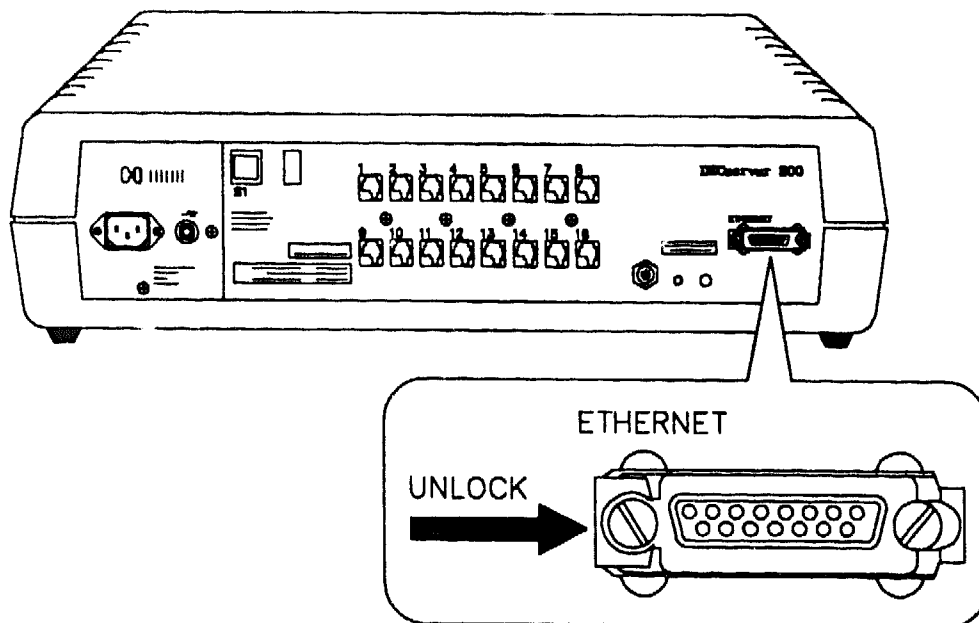
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4.6 Connecting to Standard Ethernet LAN

To connect the transceiver cable to the server, do the following:

1. Unlock the slide latch on the server's standard Ethernet connector by pushing it in the direction shown in Figure 4-12.

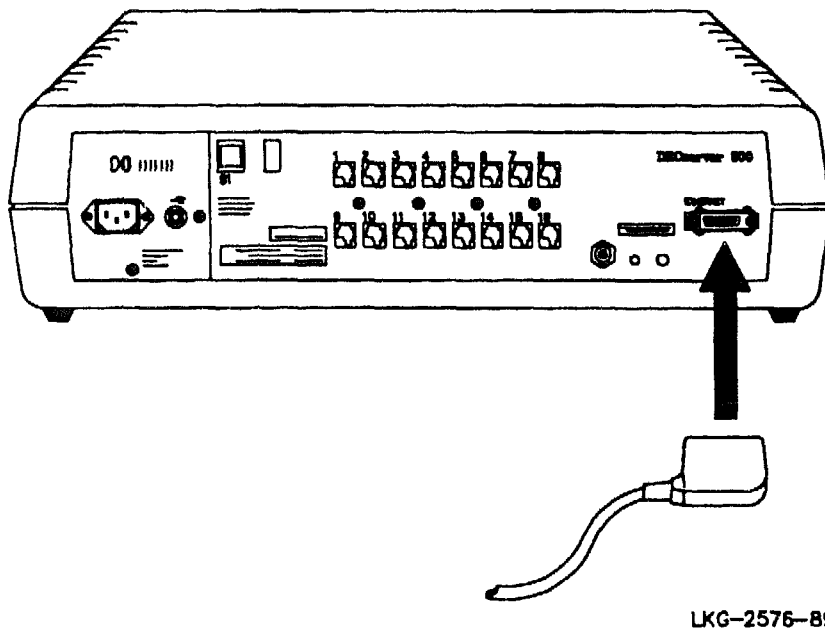
Figure 4-12: Unlocking the Slide Latch



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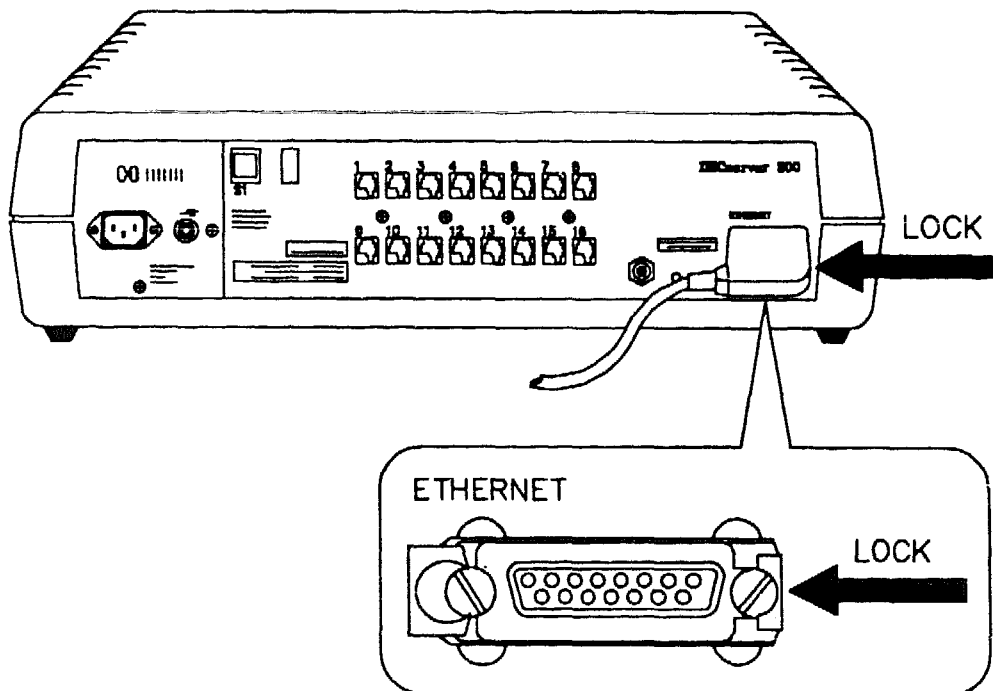
2. Connect the transceiver cable (see Figure 4-13).

Figure 4-13: Connecting the Transceiver Cable



3. Lock the slide latch on the standard Ethernet connector by pushing it in the direction shown in Figure 4-14.

Figure 4-14: Locking the Standard Ethernet Connector



4. Verify switch is in the out position and LED is off.

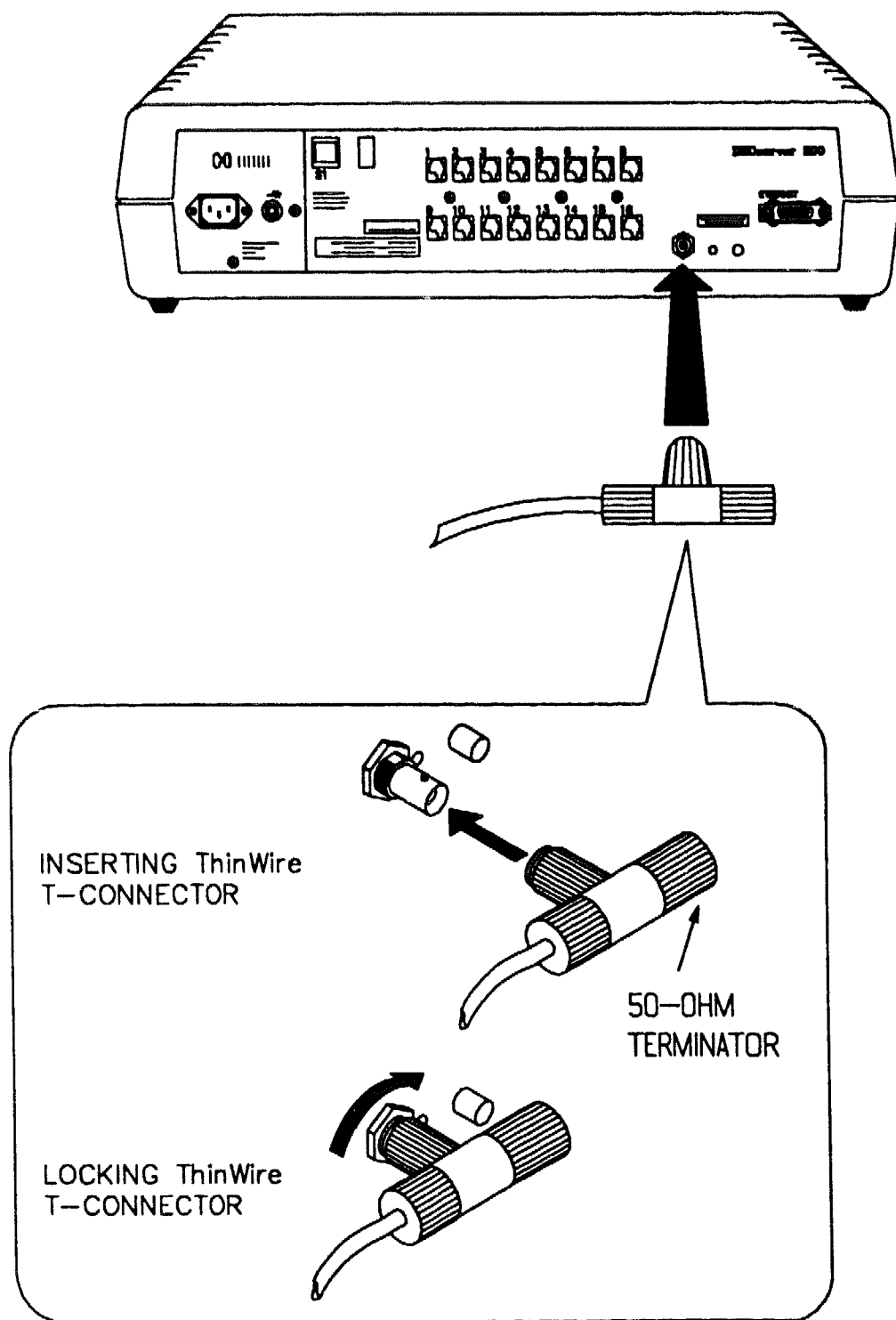
4.7 Connecting to the ThinWire Ethernet LAN

To connect to a ThinWire Ethernet LAN, insert the T-connector into the BNC connector at the rear of the server and turn the barrel of the connector clockwise to lock (see Figure 4-15).

NOTE

Figure 4-15 shows the T-connector terminated using a 50-ohm terminator. The 50-ohm terminator is replaced by a cable if the server is not at the end of a cable segment. The cable segment must be terminated by 50-ohm terminators at both ends unless a DEMPR or a DESPR is used. Where a cable segment is terminated in a DEMPR or a DESPR at one end only the opposite end needs to have a 50-ohm terminator (see Appendix C — Cabling Strategy — for further details).

Figure 4-15: Connecting to the ThinWire Ethernet LAN

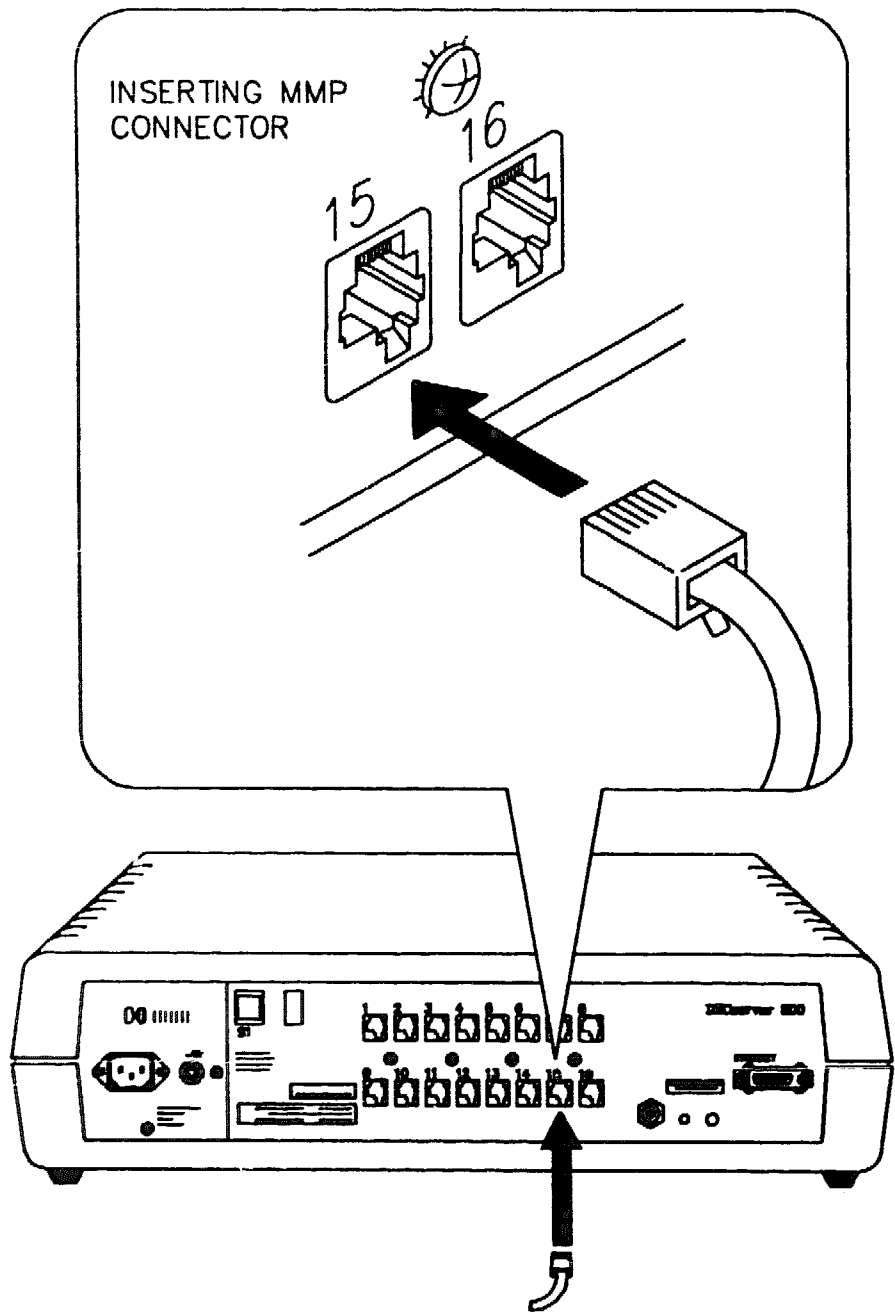


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4.8 Connecting to a Device Port

To connect a device port, insert the modified modular plug (MMP) into one of the sixteen female modified modular jack (MMJ) connectors (see Figure 4-16).

Figure 4-16: Connecting to a Device Port



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4.9 Initializing the Server

To initialize the server, reconnect the power cord. The server now runs self-test (see Section 4.4.4) and attempts to load the server software from a host.

4.10 Verifying the Server System Installation

After you install the DECserver 300 hardware, inform the system manager that the server installation is complete. You should also supply a list of the devices connected to the system and their server port locations. The person who installs the software then carries out the system verification procedure in the *DECserver 300 Software Installation* manual to ensure that the hardware and software function correctly together.

What to Do If You Have Problems

This chapter helps you identify and correct problems that may be encountered during the initial installation of the DECserver 300 hardware. The troubleshooting procedures are for diagnosing and correcting hardware-related problems only.

NOTE

Notify the server manager if the troubleshooting procedures indicate the problem is software related or if the procedures do not correct the problem. Additional troubleshooting information is provided in the *DECserver 300 Problem Solving* manual and *DECserver 300 Management* manual.

5.1 Problem Indicators

The seven-segment display, located at the rear of the server, indicates the status of the server and is used for diagnosing server problems. The diagnostic dot of the display also provides diagnostic information.

5.2 Diagnosing Server Problems

Compare the state of the seven-segment display and the diagnostic dot with those shown in Table 5-1 and go to the section indicated for information on corrective action.

NOTE

On power-up, the seven-segment display will show an "8" and the diagnostic dot will be "on" for about 0.5 seconds. Allow about 2 minutes to elapse before determining the state of the display.

Table 5-1: Display/Indications

Device	Definition	State	Indication	Corrective Action
Diagnostic Dot	Diagnostic	On	Self-test passed	--
		Off	Fatal error	Section 5.3
		Blinking	Nonfatal Error	Section 5.5
Seven-Segment Display	Status/Diagnostic	Off	No power or display broken	Section 5.3
		"9"	Nonfatal Error	Sections 5.5.6/5.5.7
		Flashing	Fatal error	Section 5.4
		"3"	Load request backoff	Section 5.6
		Rotating segment pattern	Server software executing	

5.3 Seven-Segment Display Off

Problem

Power is not reaching the DECserver 300 hardware.

Correction: Ensure that the voltage select switch is set to the correct voltage for your country (see Section 4.4).

Correction: Secure the power cable at the server and at the wall outlet and check the fuse in the power cable plug (if applicable).

Correction: Check the wall outlet using another appliance or light, or plug the server power cord into another outlet. If power is not available at the wall outlet, check the wall outlet's circuit breaker.

Correction: Check if the server circuit breaker has tripped. If it has, disconnect the power, press the white button to reset the breaker (see Figure 1-3), and reconnect the power. If the circuit breaker trips more than once, notify the server manager that the server must be returned to Digital Equipment Corporation for repair. (Refer to the *DECserver 300 Problem Solving* manual for information about returning the unit to Digital.)

Correction: Check for a defective server power cable and replace.

Problem

The DECserver 300 hardware is defective.

Correction: Notify the server manager that the server must be returned to Digital for repair or replacement. (Refer to the *DECserver 300 Problem Solving* manual for information about returning the unit to Digital.)

5.4 Diagnostic Dot Off/Seven-Segment Display Flashing

Problem

A hardware error occurred that makes the DECserver 300 server inoperative.

Correction: There is no corrective procedure for this problem. Notify the server manager that the server must be returned to Digital for repair or replacement. (Refer to the *DECserver 300 Problem Solving* manual for information about returning the unit to Digital.)

5.5 Diagnostic Dot Blinking

If the diagnostic dot is blinking after power-up it indicates that the server has a nonfatal problem detected during self-test. To isolate the problem, connect a console terminal to port 1 of the server. The primary problem indicator in this case is the error message that appears on the console terminal.

To isolate and diagnose the problem, do the following:

1. Connect a console terminal to port 1 of the server, then power up the terminal.
2. Configure the terminal to operate with a speed of 9600 bits per second and with a character size of 8 bits (no parity). (Refer to the specific terminal user's guide if you need help setting up the terminal parameters.)
3. Unplug the server power cord at the wall outlet, then reinsert it.
4. Read the error message that appears on the terminal display. (If no message appears on the terminal display, refer to Section 5.5.8.)

The following sections list the error messages that occur in conjunction with diagnostic dot blinking. Locate the section that describes the displayed error message and follow the recommended corrective action.

5.5.1 Error Messages 920 and 921

Local -920- Parameter checksum error on port(s) n

Local -921- Factory-set parameters will be applied to port(s) n

Problem

These messages indicate a port checksum error. The permanent characteristics for the indicated port do not pass the internal checksum test.

Correction: Reset the server characteristics using the server database reset switch (S1), located at the rear of the server (see Figure 1-3). Press and hold this switch in while you unplug and reinsert the server power cord. This causes the factory-set defaults for port characteristics to be reloaded into the server permanent database. If this action fails to correct the problem, the server nonvolatile memory (used to store the characteristics) is faulty. Notify the server manager that the server must be returned to Digital for repair or for replacement. (Refer to the *DECserver 300 Problem Solving* manual for information about returning the unit to Digital.)

5.5.2 Error Messages 922 and 923

Local -922- Port hardware error on port(s) n

Local -923- Port n will be disabled

Problem

These messages show a port hardware error on the ports indicated. The remaining ports may still be used.

Correction: There is no corrective procedure for this condition. Notify the server manager that the server must be returned to Digital for repair or for replacement. (Refer to the *DECserver 300 Problem Solving* manual for information about returning the unit to Digital.)

5.5.3 Error Messages 925 and 926

Local -926- DSR/DTR signal error on port(s) n

Local -925- Port(s) may be used with data leads only

Problem

This message indicates a hardware error with the DSR/DTR circuitry for a particular port, the ports may only be used as data-leads-only.

Correction: There is no correction for this problem. Notify the server manager that the server must be returned to Digital for repair or for replacement. (Refer to the *DECserver 300 Problem Solving* manual for information about returning the unit to Digital.)

5.5.4 Error Messages 930 and 931

Local -930- Server parameters checksum error
Local -931- Factory-set server parameters will be applied

Problem

The server characteristics in the server permanent database are not operational. The factory-set defaults will be applied by the software when loaded.

Correction: Reset the server characteristics using the server database reset switch (S1), located at the rear of the server (see Figure 1-3). Press and hold this switch in while you unplug and reinsert the server power cord. If this fails to correct the problem, the memory used to store the characteristics is faulty. Notify the server manager that the server must be returned to Digital for repair or for replacement. (Refer to the *DECserver 300 Problem Solving* manual for information about returning the unit to Digital.)

5.5.5 Error Messages 935 and 936

Local -935- Service characteristic checksum error
Local -936- Service will be disabled

Problem

The service characteristics in the server permanent database are not operational. The service will be disabled.

Correction: Reset the server characteristics using the server database reset switch (S1), located at the rear of the server (see Figure 1-3). Press and hold this switch in while you unplug and reinsert the server power cord. This will result in all services being cleared out.

5.5.6 Error Messages 941, 942, 950 and 952 /Display shows "9" — Standard Ethernet

Local -941- Transceiver Loopback error
Local -942- Image load not attempted
Local -950- Troubleshooting procedures should be followed
Local -952- Enter ^P to restart selftest

Problem

The Ethernet external loopback test has failed. There is a fault in either the external Ethernet cabling or the server.

Correction: Check the transceiver cable. Ensure the connections are secure at both ends of the cable. Check the cable for any signs of damage. If the cable appears damaged, replace it and run the self-test again.

Correction: If the above actions do not correct the problem, verify the server external Ethernet circuit with a loopback connector. If the Ethernet loopback connector (12-22196-02) is available do the following (If this loopback connector is not available switch to ThinWire and refer to 5.5.7. This will check the server Ethernet as far as the selector switch on the standard Ethernet circuit):

1. Disconnect the transceiver cable from the server.
2. Plug the Ethernet loopback connector into the Ethernet connector on the server.
3. Initialize the server by pressing **CTRL/P** on your console terminal, or by unplugging the server power cord from the wall outlet and then reinserting it.
4. Wait 2 minutes for the diagnostic test to complete, then observe the status of the diagnostic dot.
 - a. If the diagnostic dot continues to blink and the error message reappears after the self-test, the server is faulty and must be returned to Digital for repair or for replacement. Notify the server manager.
 - b. If the diagnostic dot is on continuously, go to step 5 to isolate and to determine the faulty unit.

NOTE

When using the Ethernet loopback connector to troubleshoot the DECserver 300 hardware, if the self-test detects no errors, the server attempts to down-line load the server image. Since the server is disconnected from the network, the down-line load fails and the server responds by displaying the appropriate code (see Appendix F).

5. Unplug the Ethernet loopback connector from the Ethernet connector on the server.
6. Reconnect the transceiver cable to the Ethernet connector on the server
7. Disconnect the other end of the transceiver cable.
8. Plug the Ethernet loopback connector into the transceiver cable.
9. Initialize the server by pressing **CTRL/P** on your console terminal, or by unplugging the server power cord from the wall outlet and then reinserting it.
 - a. If the diagnostic dot continues to blink, the transceiver cable is faulty and must be replaced.

- b. If the diagnostic dot is on continuously, the faulty unit is the device that the transceiver cable is connected to. Notify the server manager so that arrangements can be made for repair or for replacement of the faulty device.

5.5.7 Error Messages 941, 942, 950 and 952 /Display shows "9" — ThinWire Ethernet

Local -941- Transceiver Loopback error
Local -942- Image load not attempted
Local -950- Troubleshooting procedures should be followed
Local -952- Enter `P to restart selftest

Problem

The Ethernet external loopback test has failed. There is a fault in either the external Ethernet cabling or the server.

Correction: Check the ThinWire coaxial cable. Ensure connections are secure at both ends of the cable. Check the cable for any signs of damage. If the cable appears damaged, replace it. (If the server is not at the beginning or end of the segment there will be two cables to check.) Check for correct terminations.

Correction: If the above does not correct the problem, do the following:

1. Disconnect the cable at the T-piece and replace it with a 50-ohm terminator. (If the server is not at the beginning or end of a segment there will be two cables. Replace them both with 50-ohm terminators.)
2. Initialize the server by pressing **CTRL/P** on your console terminal, or by unplugging the server power cord from the wall outlet and then reinserting it.
3. Wait 2 minutes for the diagnostic test to complete, then observe the status of the diagnostic dot.
 - a. If the diagnostic dot continues to blink and the error message reappears after the self-test, the server is faulty and must be returned to Digital for repair or for replacement. Notify the server manager.
 - b. If the diagnostic dot is on continuously, go to step 4 to isolate and to determine the faulty unit or cable.

NOTE

When using the T-piece and 50-ohm terminators to troubleshoot the DECserver 300, if the self-test detects no errors, the server attempts to down-line load the server image. Since the server is disconnected from the network, the down-line load fails and the server displays the appropriate code (see Appendix F).

4. Unplug the 50-ohm terminator and reconnect the ThinWire coaxial cable to the server T-piece.
5. Disconnect the other end of the ThinWire coaxial cable and terminate it with a 50-ohm terminator.
6. Initialize the server by pressing **CTRL/P** on your console terminal, or by unplugging the server power cord from the wall outlet and then reinserting it.
 - a. If the diagnostic dot continues to blink, the transceiver cable is faulty and must be replaced.
 - b. If the diagnostic is on continuously the cable is working. If there is a second cable return to step 4 and check it also. If both cables are found to be working, the fault lies with some other device or cable on the segment. Notify the server manager so that arrangements can be made for repair or for replacement of the faulty device or cable.

5.5.8 No Messages on Console Terminal

No messages appear on the console terminal when the server initializes.

Problem

The port to which the console terminal is physically connected is not defined as the console port.

Correction: Ensure the console terminal is physically connected to port 1 on the server.

Problem

The console terminal is faulty.

Correction: Replace the console terminal with another and set the device parameters as described at the beginning of Section 5.5.1.

Problem

The internal characteristics for the console terminal are not set up correctly.

Correction: Reset the internal characteristics for the console terminal as described at the beginning of Section 5.5.1.

NOTE

For server installation, the console terminal must be configured to operate with a speed of 9600 bits per second and with a character size of 8 bits (no parity).

5.6 Seven-Segment Display displays a “3”

If the seven-segment display displays a “3” after power-up, it may indicate the server has a down-line load problem (see Appendix F). To isolate and to diagnose the problem, do the following:

1. Connect a terminal to port 1 of the server, then power up the terminal.
2. Configure the terminal to operate with a speed of 9600 bits per second and a character size of 8 bits (no parity). (Refer to the specific terminal user's guide if you need help setting up the terminal parameters.)
3. Initialize the server by pressing **CTRL/P** on your console terminal.
4. Read the message that appears on the terminal display.

The following 900-series messages on the console terminal indicate down-line loading problems. Each is covered in the following sections.

5.6.1 Down-Line Load Starts, then Fails

5.6.1.1 Error Message 912

The following message appears on the console terminal:

Local -912- Load failure, timeout

Problem

The host system failed to complete the down-line load to the server.

Correction: Copy the error message exactly as it appears on the console terminal and notify the server manager.

5.6.1.2 Error Message 916

The following message appears on the console terminal:

```
Local -916- Illegal load image, load aborted
```

Problem

The software image installed on the host does not match the DECserver 300

Correction: Copy the error message exactly as it appears on the console terminal and notify the server manager.

5.6.2 Down-Line Load Does Not Start

The following sequence of messages appears on the console terminal at various time intervals:

```
Local -953- Attempting to locate load host, [ISO8802]  
Local -953- Attempting to locate load host, [ETHERNET]  
Local -951- DECserver will retry operation in n seconds
```

Problem

Load host(s) not responding to server down-line load requests.

Correction: Copy the error message exactly as it appears on the console terminal and notify the server manager

Connector and Cable Pin Descriptions

This appendix describes the pins of the DECserver 300 hardware connectors and the pins of the cables that are used to interface to the DECserver 300 hardware. Wiring diagrams of the individual cables are given to help in troubleshooting and cable building.

A.1 Connector Pin Descriptions

This section describes the pins of the following DECserver 300 connectors:

- Ethernet transceiver interface
- Device port connector — modified modular jack (MMJ)

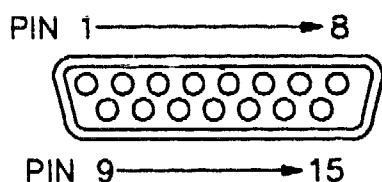
A.1.1 Ethernet Transceiver Interface

The DECserver 300 hardware has a ThinWire Ethernet connector and a standard Ethernet connector. The ThinWire Ethernet connector is a 50-ohm, RG58-type, BNC connector with one pin and a shield.

The standard Ethernet transceiver interface matches the signal specifications described in *The Ethernet; A Local Area Network; Data Link Layer and Physical Layer Specification*.

Figure A-1 shows how the pins are numbered on a standard Ethernet transceiver interface connector. The signals for the standard Ethernet connector pins are listed in Table A-1.

Figure A-1: Pin Numbers for Standard Ethernet Transceiver Interface Connector



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Table A-1 : Pin Descriptions for Standard Ethernet Transceiver Interface

Pin Number	Signal Name
1	Shield
2	Collision presence +
3	Transmit +
4	Reserved
5	Receive +
6	+12 Volt Power return
7	Reserved
8	Reserved
9	Collision presence -
10	Transmit -
11	Reserved
12	Receive -
13	+12 Volt Power
14	Reserved
15	Reserved

A.1.2 Port Connector Interface

Modified modular jack (MMJ) connectors are used for connecting devices to the ports on the DECserver 300 hardware.

Figure A-2 shows how the pins are numbered on an MMJ connector and Table A-2 lists the signals on the pins.

Figure A-2: Pin Number for Serial Communication Connector

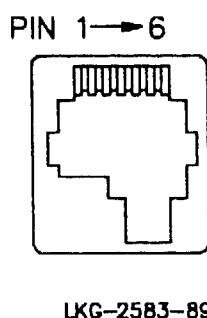


Table A-2 : Pin Descriptions for Serial Communication Interface

Pin Number	Signal Name
1	DTR
2	Transmit data
3	Transmit common
4	Receive common
5	Receive data
6	DSR

A.2 Cable Structure

This section describes the cable structure that is compatible with the DECserver 300 hardware. Wiring diagrams of individual cables are provided for use in troubleshooting and cable building.

A.2.1 DECconnect SER Cable

The DECconnect SER (Satellite Equipment Room) cable is an “octopus” cable that has a 32-core cable terminated in a 36-pin D-connector at one end and eight 6-core, cables terminated in modified modular plugs (MMP) at the other end. The DECconnect SER cable is used to connect the DECserver 300 device port lines to a DECconnect patch panel. There are two versions of this cable:

- BC23P-10 (unshielded)
- BC23R-10 (shielded)

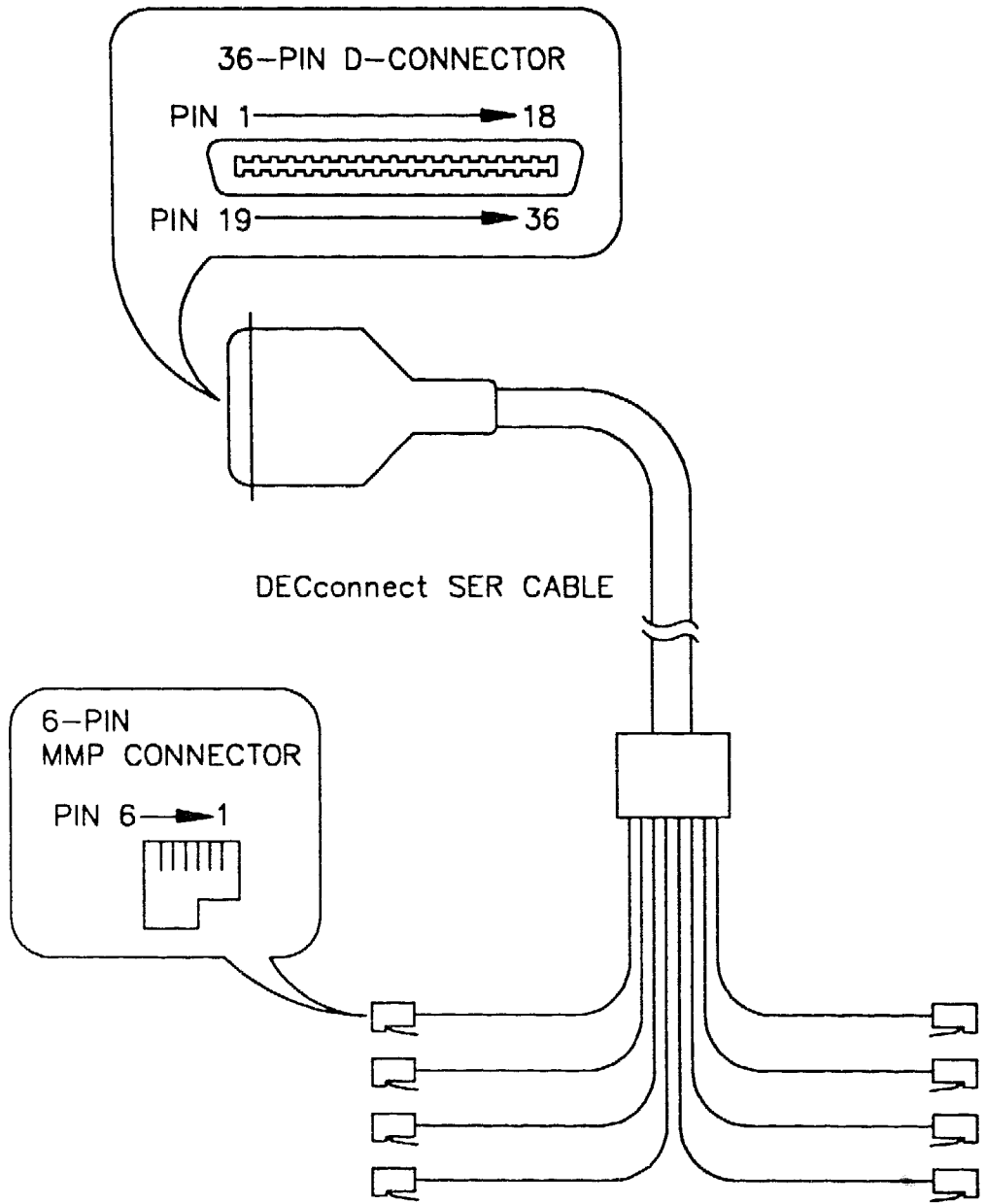
NOTE

This is a data-leads-only cable, the DTR and DSR signals are not routed through the 36-pin D-connector.

Figure A-3 shows how the pins are numbered and also shows the structure of the cables. The wiring diagram is shown in Figure A-4.

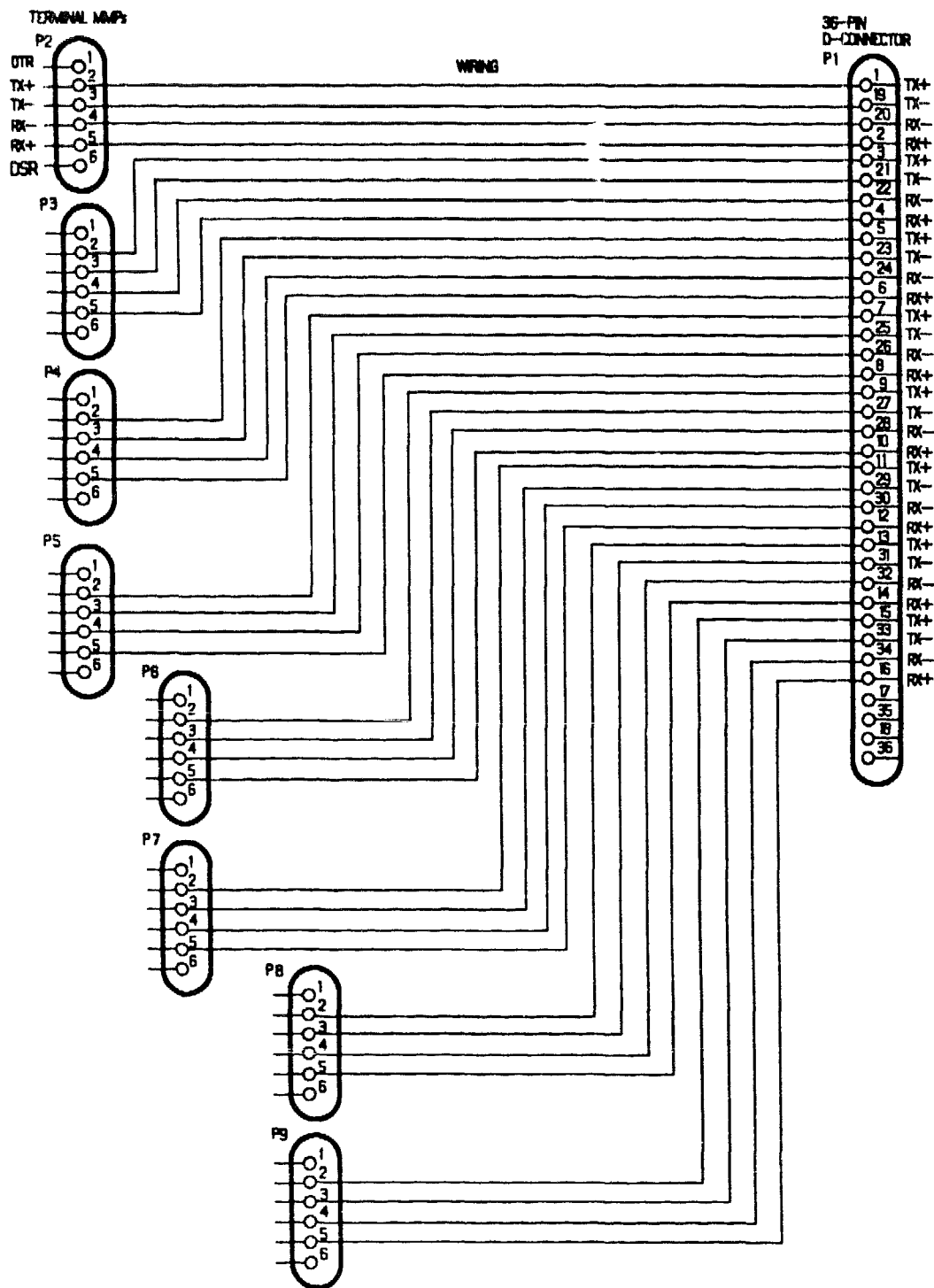
1

Figure A-3: DECconnect SER Cable — Pin Numbers



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Figure A-4: DECconnect SER Cable - Wiring Diagram

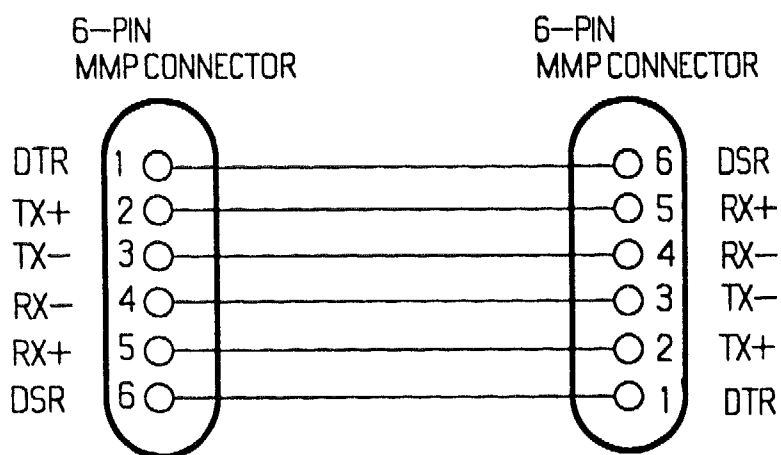


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A.2.2 DEC Office Cable (BC16E-xx)

The BC16E is an unshielded 6-conductor flat cable. This cable is terminated at both ends with an MMP. A wiring diagram of the BC16E-xx is shown in Figure A-5.

Figure A-5: Wiring Diagram for BC16E-xx Cable



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A.3 Cable Adapters, Couplers, and Loopback Connectors

This section describes the adapters, couplers and loopback connectors which are used with the DECserver 300 hardware and cables.

A.3.1 H8571-x EIA-423-A to EIA-232-D Passive Adapters

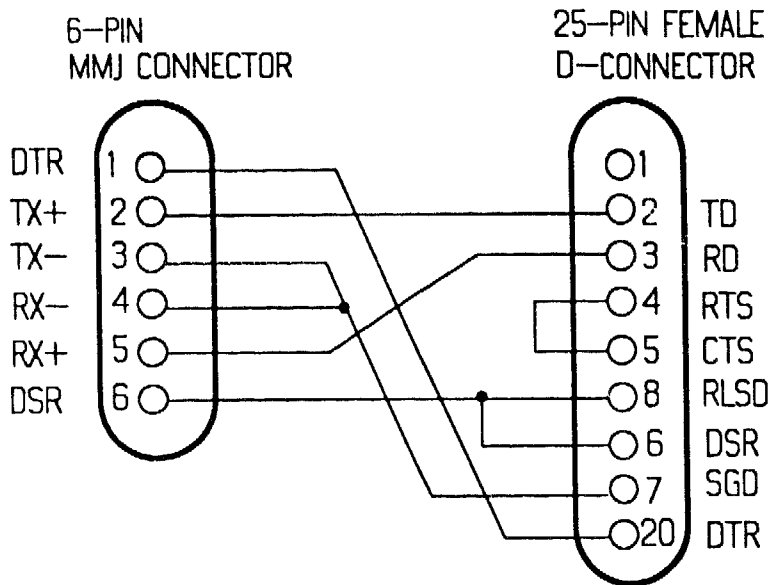
The H8571-x passive adapters are used to adapt 25-pin and 9-pin D-connectors, used on some EIA-232-D terminals and printers, to MMJs. Each adapter provides a modified modular jack on one side and a D-connector on the other side. The following models of the adapter are available:

- H8571-A — MMJ to 25-pin D-connector, female, filtered, with jack screws. Used for connecting to terminal communication ports.
- H8571-B — MMJ to 9-pin D-connector, female, filtered, with jack screws. Used for connecting to 9-pin printer ports.
- H8571-C — MMJ to 25-pin D-connector, male, unfiltered, with mounting hex nuts. Used for connecting from MMJ ports to an EIA-232 connection.
- H8571-D — MMJ to 25-pin D-connector, male, filtered, with jack screws.

- H8571-E — MMJ to 25-pin D-connector, male, filtered, with jack screws.

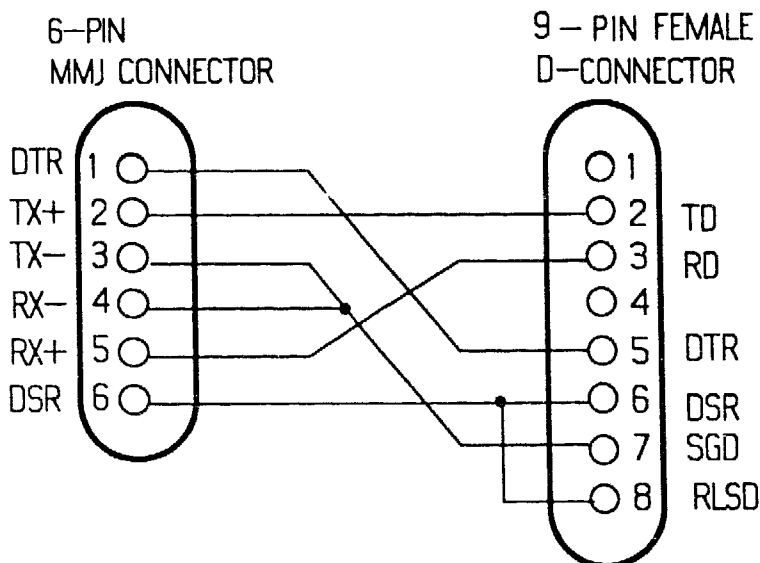
Figure A-6, Figure A-7, Figure A-8, Figure A-9, and Figure A-10 show the wiring diagrams for the H8571-A, H8571-B, H8571-C, H8571-D and H8571-E models of the H8571 adapter.

Figure A-6: Wiring Diagram — H8571-A Adapter



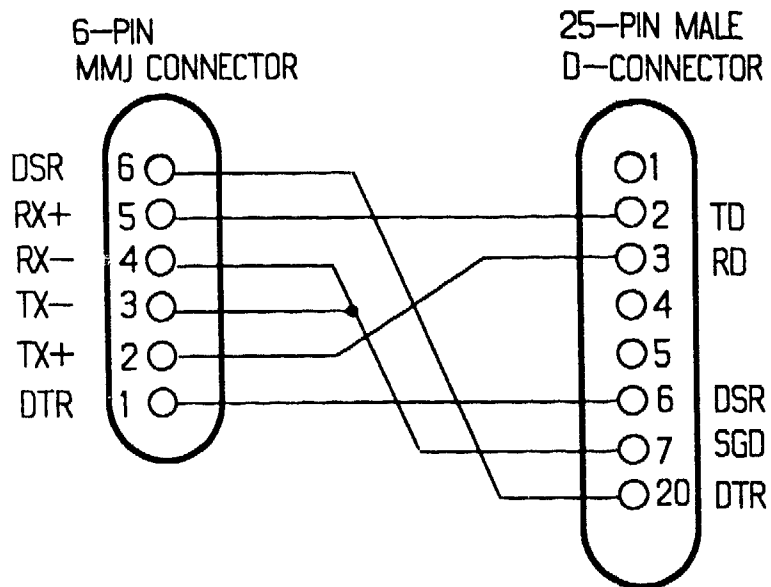
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Figure A-7: Wiring Diagram — H8571-B Adapter



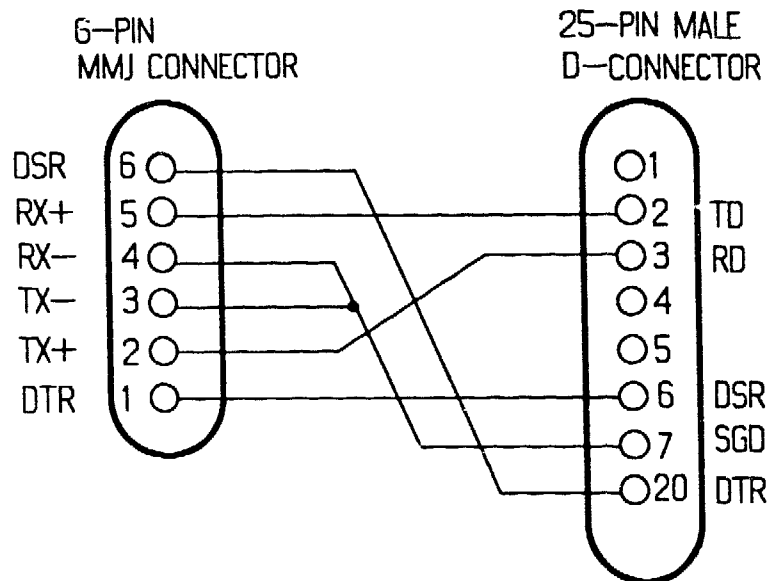
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Figure A-8: Wiring Diagram — H8571-C Adapter



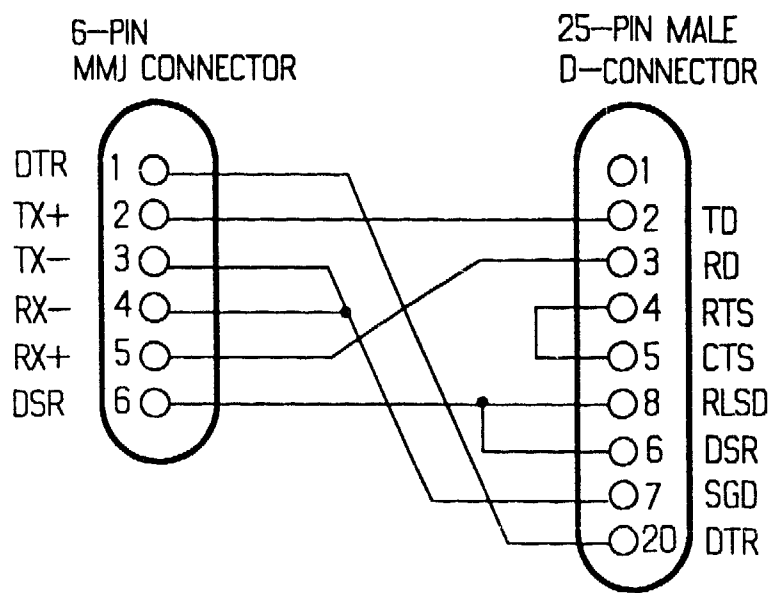
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Figure A-9: Wiring Diagram — H8571-D Adapter



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Figure A-10: Wiring Diagram — H8571-E Adapter

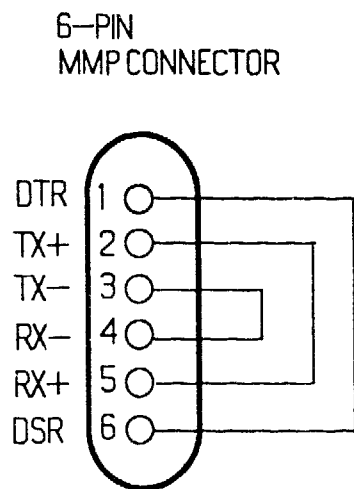


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A.3.2 H3103 MMJ Loopback Connector

The H3103 MMJ loopback connector is used to loop back signals from the server. A wiring diagram of the H3103 loopback connector is shown in Figure A-11.

Figure A-11: Wiring Diagram — H3103 Loopback Connector

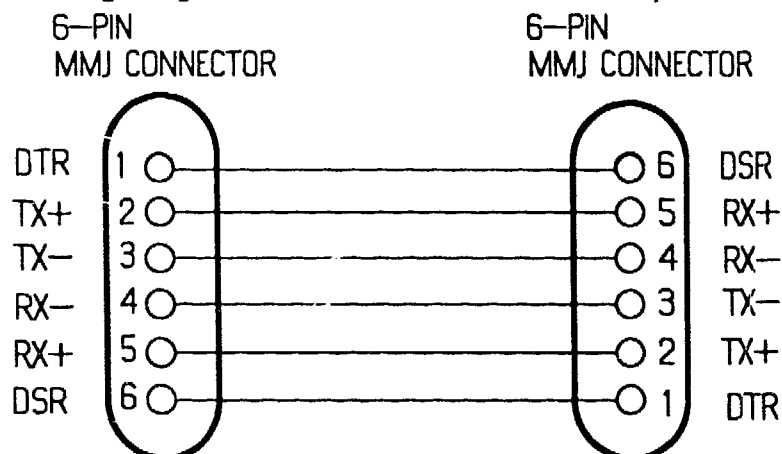


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A.3.3 H8572 6-Pin Cable Coupler

The H8572 cable coupler is used to join two BC16E-xx cables. The coupler consists of two back-to-back MMJs. A wiring diagram of the H8572 cable coupler is shown in Figure A-12.

Figure A-12: Wiring Diagram — H8572 6-Pin Cable Coupler

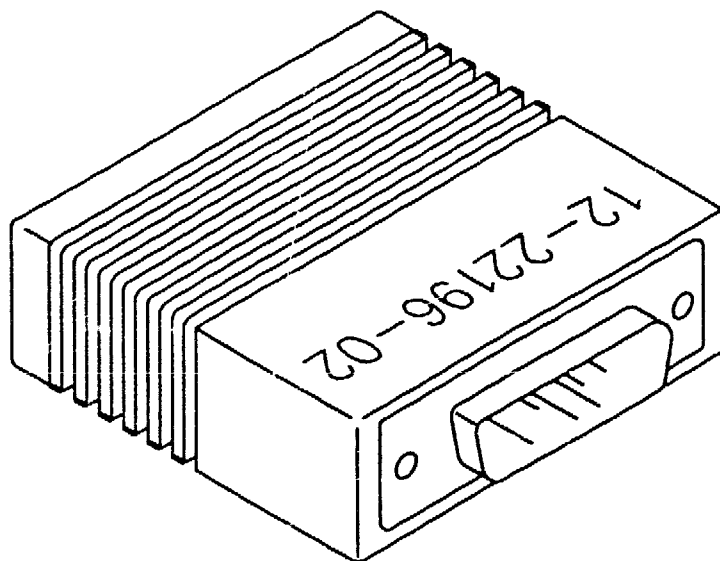


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A.3.4 Loopback Connector (DEC 12-22196-02)

The loopback connector (DEC 12-22196-02) is plugged into the standard Ethernet connector to loop back the Ethernet signals. Figure A-13 shows the loopback connector (DEC 12-22196-02)

Figure A-13: Loopback Connector (DEC 12-22196-02)

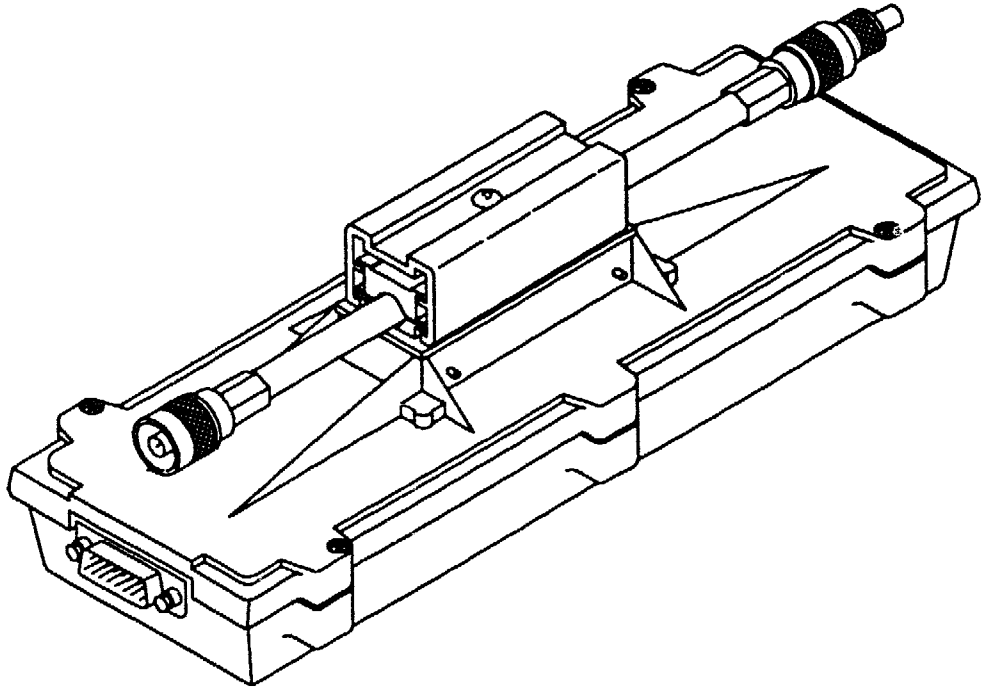


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A.3.5 H4080 Turnaround Connector

The H4080 turnaround connector is used in conjunction with a standard Ethernet transceiver cable to loop back the Ethernet signals. Figure A-14 shows a H4080 turnaround connector.

Figure A-14: H4080 Turnaround Connector



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[illegible][illegible]

Port Devices Supported by the DECserver 300

This appendix lists port devices that are supported by the DECserver 300 system. For the latest listing of supported devices, see the *DECserver 300 Software Product Description* that applies to your operating system.

B.1 Terminals

The DECserver 300 system supports Digital Equipment Corporation and non-Digital terminals that generate both 7-bit and 8-bit characters.

Digital terminals supported by DECserver 300 include:

- LA12, LA34, LA35, LA36, and LA38
- VT52
- VT101, VT102, VT125, VT131
- VT220, VT240, VT241
- VT320, VT330, VT340

B.2 Personal Computers

The DECserver 300 system supports Digital and non-Digital personal computers in either terminal emulation mode or in file transfer mode.

Digital personal computer supported by DECserver 300 include:

- Professional 325, Professional 350, Professional 380

- Rainbow 100A, Rainbow 100B, Rainbow 100+
- DECmate II, and III
- VAXmate

Non-Digital personal computers supported by DECserver 300 include:

- IBM PC
- IBM PC/XT
- IBM PC AT

B.3 Printers

The DECserver 300 system supports Digital and non-Digital printers that use RS-232-C (EIA-232-D) and EIA-423-A serial ports.

Digital printers supported by DECserver 300 include:

- LA50, LA200, LA210
- LN01S, LN03S (Laser printers)
- LCP01 (Ink Jet Printer)
- LQP02, LQP03 (Letter Quality Printers)
- LXY12-DA, LXY22-DA (Graphics Printers)
- LG01S, LG02 (Graphics Printers)
- DCT01, DCT03 (DECtalk)

Cabling Strategies

C.1 Server-to-Network Connection

The DECserver 300 hardware can be connected to either a standard Ethernet, or a ThinWire Ethernet, local area network. The following sections describe common strategies that are used.

C.1.1 Standard Ethernet Connection

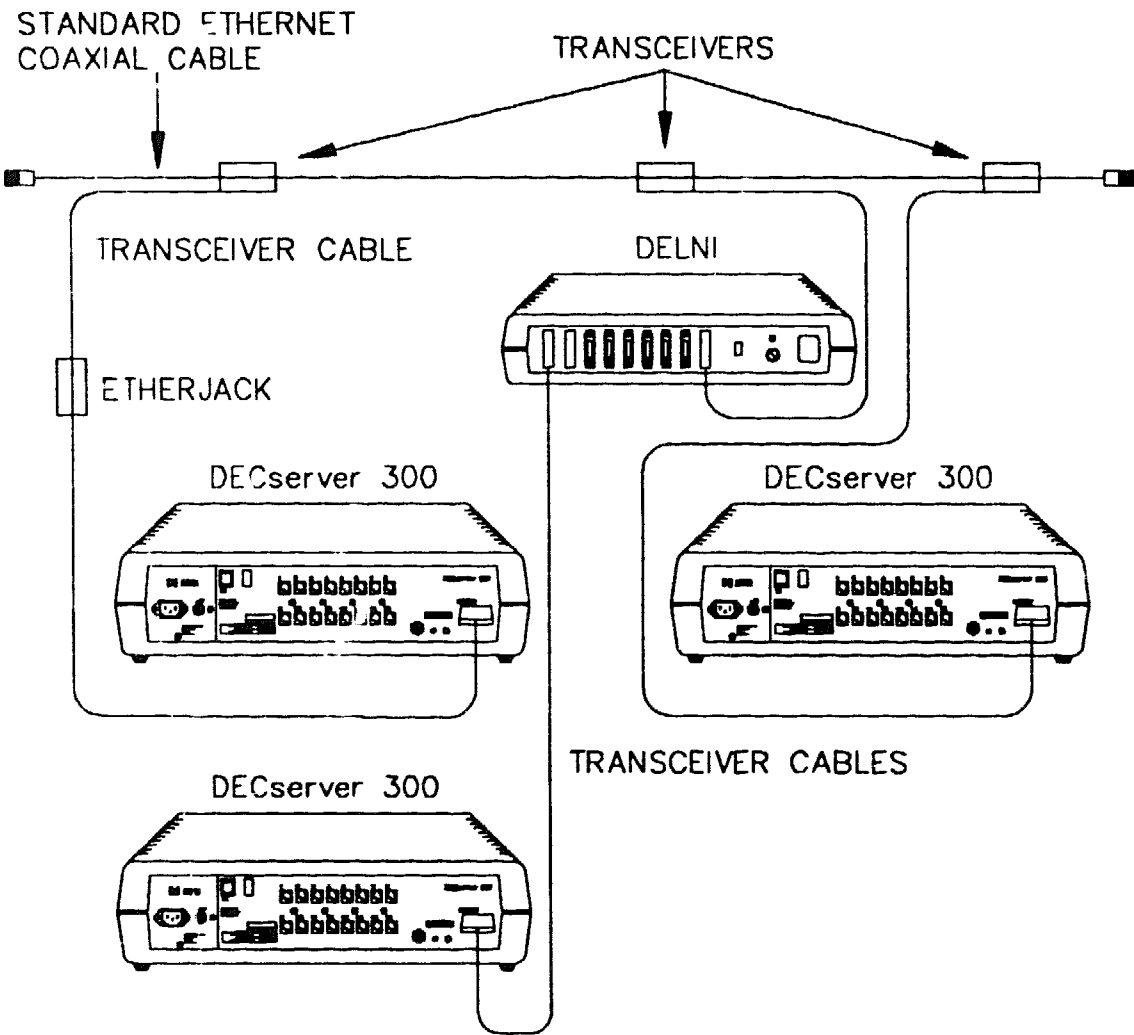
A transceiver cable connects the server to the standard Ethernet network (see Figure C-1). The transceiver cable can be connected to any of the following:

- Another transceiver cable section. This cable can be secured in an Etherjack junction box.
- A DELNI local area interconnect.
- A transceiver on a standard Ethernet coaxial cable for Digital Equipment Corporation baseband networks or a DECOM for Digital Equipment Corporation broadband networks.
- A standard rack cabinet in a Satellite Equipment Room (SER) for DECconnect systems. See the *DECconnect System Planning and Configuration Guide* for installing the DECserver 300 DECconnect systems.

NOTE

The DECserver 300 is compatible with digital baseband and broadband Ethernet products and with Ethernet and IEEE 802.3 specifications.

Figure C-1: Standard Ethernet Coaxial Cable Connection



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C.1.2 ThinWire Ethernet Connection

A ThinWire coaxial cable connects the server to the system. The server can be connected as follows:

- As part of a stand-alone ThinWire Ethernet coaxial cable segment
- As part of a DEMPR or DESPR ThinWire Ethernet coaxial cable segment

Figure C-2 shows servers connected as part of a ThinWire Ethernet segment.

NOTE

A ThinWire segment must begin and end in a 50-ohm terminator as shown in Figure C-2.

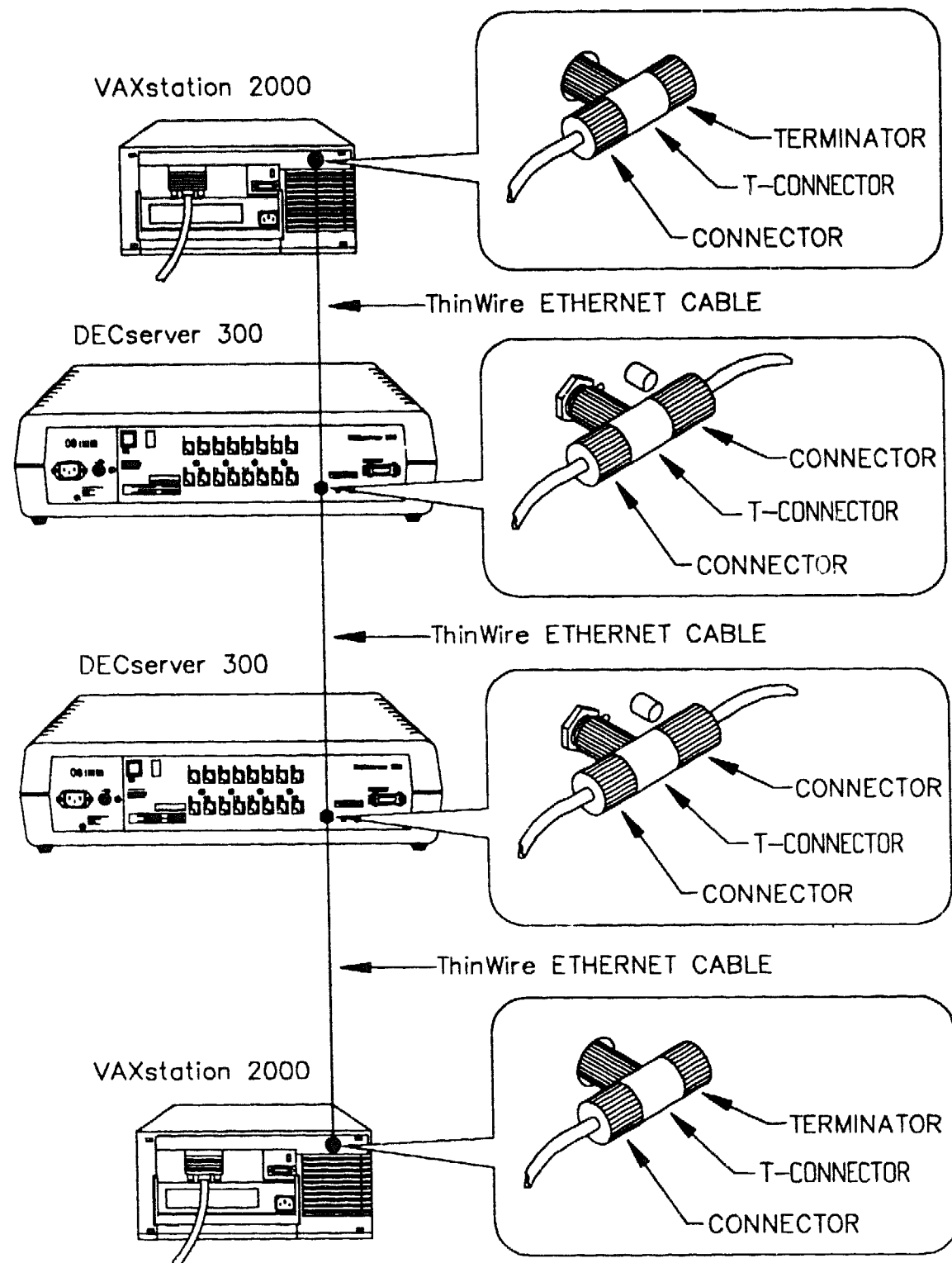
Figure C-3 shows servers connected as part of DEMPR ThinWire Ethernet segment

NOTE

The DEMPR and DESPR terminate the line internally in 50 ohms so that it is not necessary to use a 50-ohm terminator. However, all unused lines on the DEMPR must have a 50-ohm terminator installed as shown in Figure C-4.

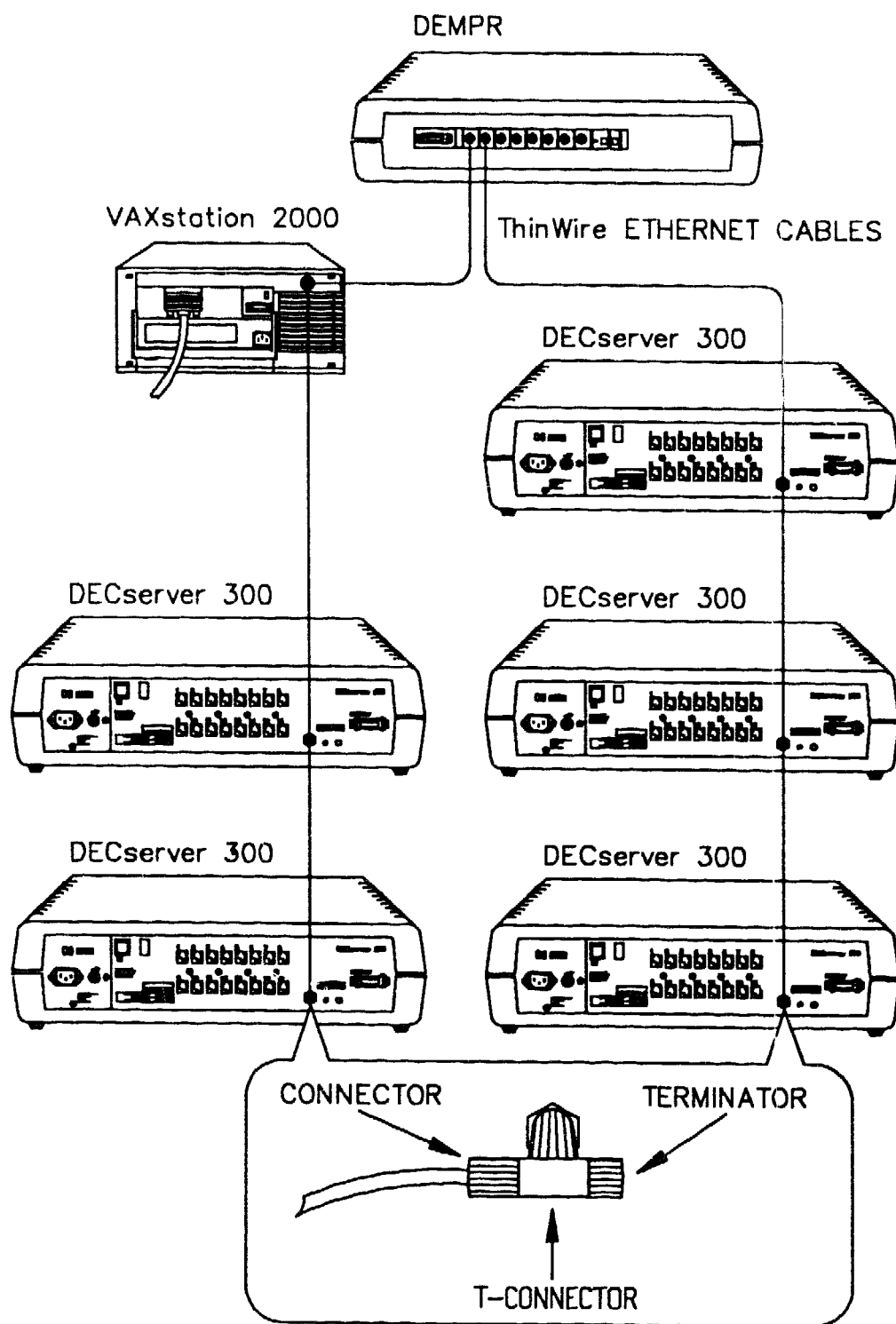
Further information on ThinWire Ethernet installation may be found in *DECconnect System Planning and Configuration Guide*.

Figure C-2: ThinWire Ethernet Stand-Alone Segment



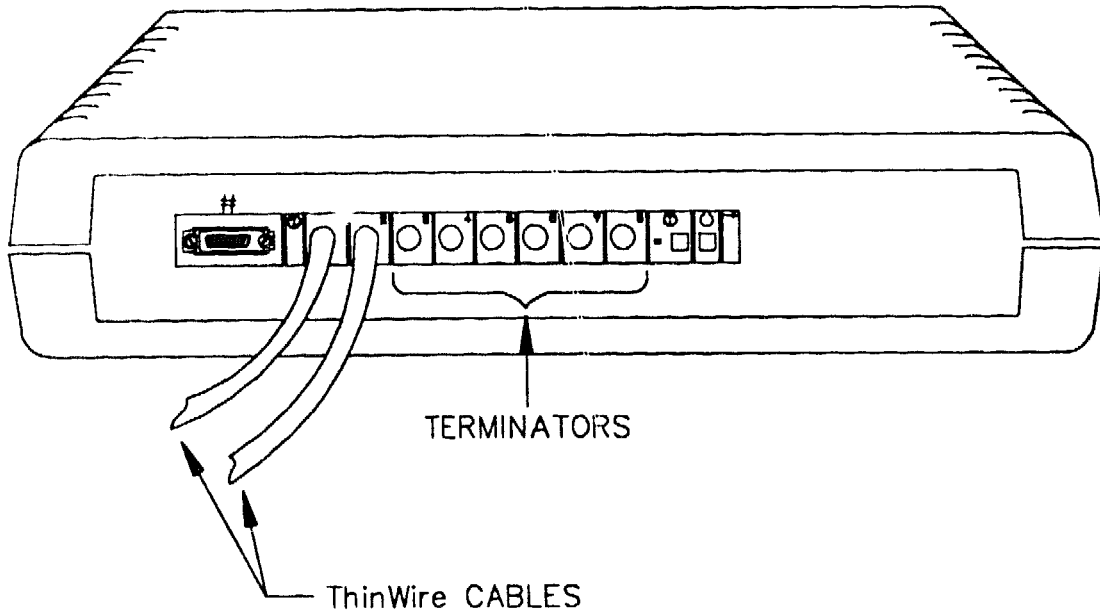
LKG-2594-89

Figure C-3: DEMPR ThinWire Connection



LKG-2585-89

Figure C-4: DEMPR Connections



LKG-2596-89

C.2 Server-to-Device Connection

The server can be connected to devices directly or by using a patch panel (in a rack-mount configuration). The following sections describe both methods.

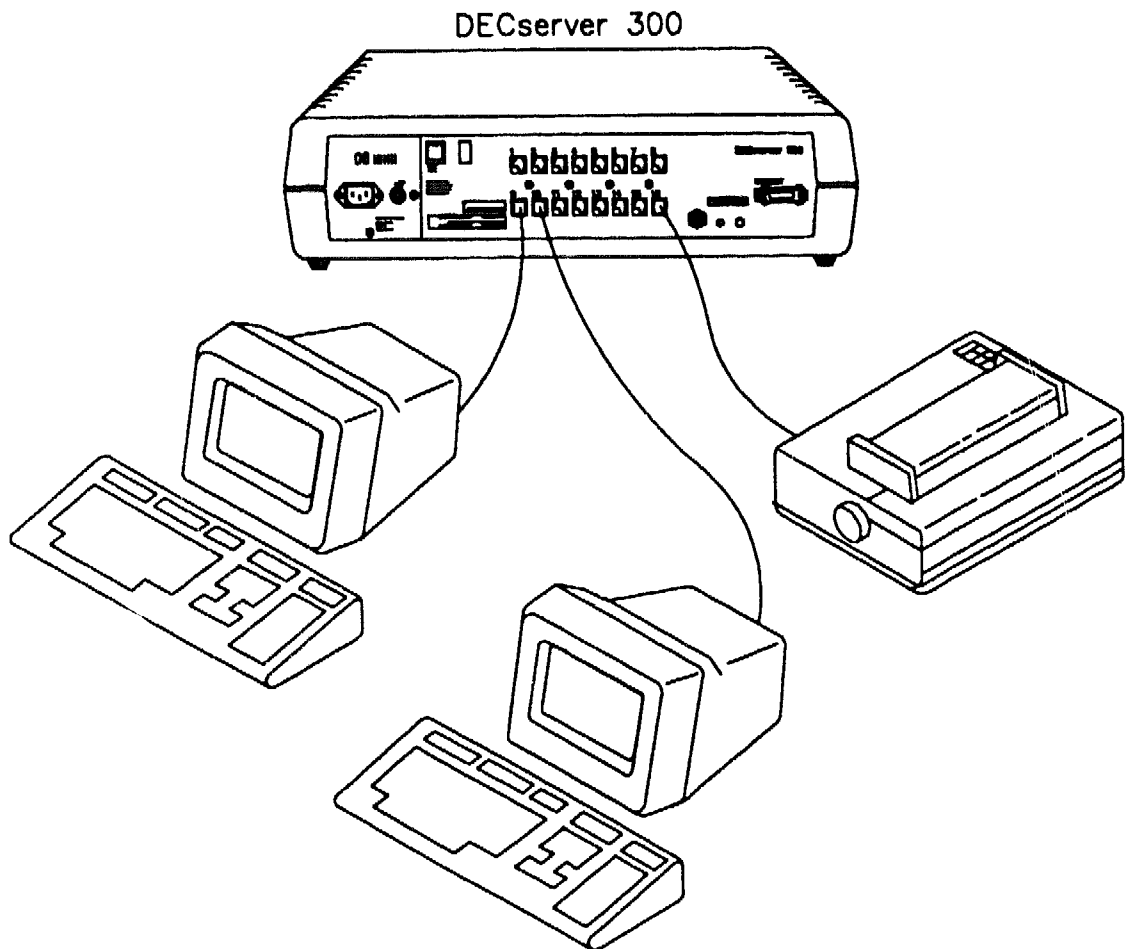
C.2.1 Connecting to Server Directly

If the device has an MMJ connector, you connect the server using BC16E-xx cable directly. If the device has a 25-pin D-connector, put a 25-pin adapter (H8571-A) on the device end of the BC16E-xx cable to make the connection (see Figure C-6). If the device uses a 9-pin D-connector, use a 9-pin adapter (H8571-B). The adapters available are listed below:

- H8571-A — MMJ to 25-pin D-connector, female, filtered, with jack screws. Used for connecting to terminal communication ports.
- H8571-B — MMJ to 9-pin D-connector, female, filtered, with jack screws. Used for connecting to 9-pin printer ports.
- H8571-C — MMJ to 25-pin D-connector, male, unfiltered, with mounting hex nuts. Used for connecting from MMJ ports to an EIA-232 connection.
- H8571-D — MMJ to 25-pin D-connector, male, filtered, with jack screws.

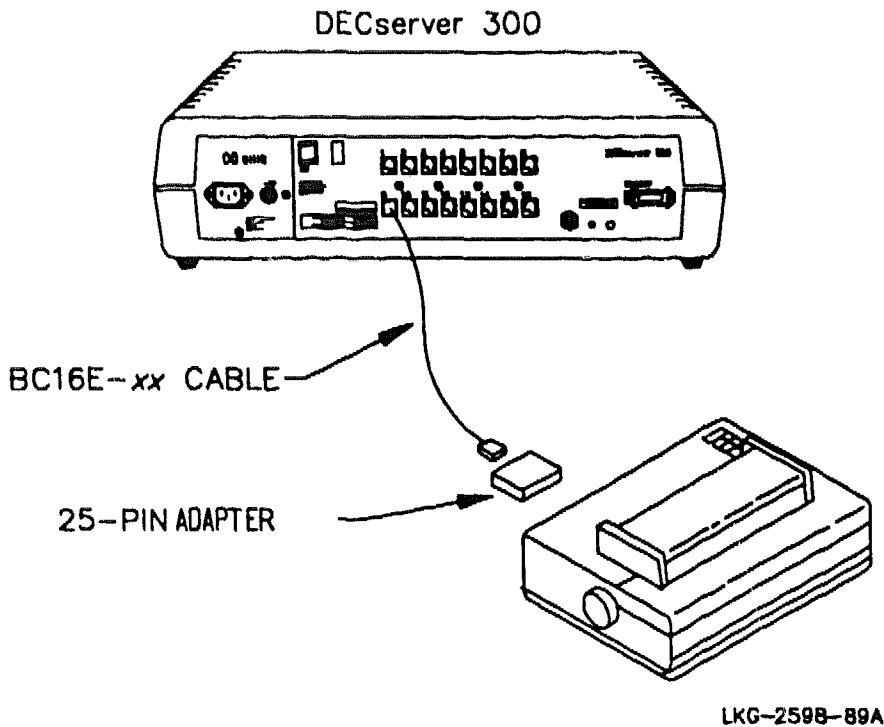
- H8571-E — MMJ to 25-pin D-connector, male, filtered, with jack screws.

Figure C-5: Connecting to Server Directly



LKG-2597-89A

Figure C-6: Using the 25-Pin D-Adapter



C.2.2 Connecting to Patch Panel

In the rack mount configuration the server is connected to a patch panel using a DECconnect SER cable, BC23P-10 (unshielded) or BC23R-10 (shielded).

NOTE

The BC23R-10 shielded cable has ground tabs at the MMP (Micro-Mini Plug) end that must be attached to the DECserver 300 Earthing Screws (see Figures 1-3, A-3, and A-4).

Ordering Information

This appendix lists order codes for DECserver 300 hardware related products. See your Digital sales representative to purchase equipment.

For a listing of software options, see the *DECserver 300 Software Product Description* that applies to your operating system.

D.1 DECserver 300 Shipment

The DECserver 300 shipment consists of the following:

- DECserver 300
- BNC T-connector
- BNC 50-ohm terminators (2)
- Software License
- H3103 loopback connector
- Country Kit (must be ordered separately outside U.S.A.)

The order code for this shipment is give in Table D-1.

Table D-1: DECserver 300 Order Codes

Description	Order Code
120 Vac (includes DSRVF-KA country kit)	DSRVF-BA
220 Vac (does not include country ki?)	DSRVF-BB

D.1.1 Decserver 300 Country Kits

The DECserver 300 country kits consist of :

- Power Cord
- *DECserver 300 Hardware Installation* manual
- *DECserver 300 Identification Card*
- Blank ID Labels
- Rack Mount Kit
- FTZ Card (Austria and Germany Only)

The order number for the country kits are given in Table D-2.

Table D-2: DECserver 300 Country kits

Country	Order Code
Australia	DSRVF-KZ
Belgium	DSRVF-LA
Canada (English and French)	DSRVF-KA
Denmark	DSRVF-KD
Finland	DSRVF-LA
France	DSRVF-LA
Germany & Austria	DSRVF-KG
Holland	DSRVF-LA
Italy	DSRVF-KI
India	DSRVF-LJ
Israel	DSRVF-KT
Japan	DSRVF-KJ
New Zealand	DSRVF-KZ
Norway	DSRVB-LA
Spain	DSRVF-LA
Sweden	DSRVF-LA
Switzerland (French and German)	DSRVF-LB
United Kingdom	DSRVF-KE
United States	DSRVF-KA

D.2 DECserver 300 Accessories

Table D-3 gives a brief description of the accessories that are used with the server and their order codes.

Table D-3: DECserver 300 Accessories

Description	Order Code
Ethernet turnaround connector — For testing transceiver and transceiver cable	H4080
Ethernet loopback connector — For loopback testing the DECserver 300 Ethernet port and transceiver cable	12-22196-02
Etherjack kit — For covering an securing transceiver cable connections	DEXJK
Wall/partition mounting bracket kit — for mounting the DECserver 300 to walls or office partitions	H039
Rack mount kit — For mounting the DECserver 300 in standard rack cabinets	H041-AA
EIA-423-A to EIA-232-D active converter	H3105
DECconnect SER cable — unshielded	BC23P-10
DECconnect SER cable — shielded	BC23R-10
H3104 — cable concentrator (unshielded)	H3104
H3104 — cable concentrator (shielded)	H3125

D.3 DEC OFFICE Cable (BC16E) and Adapters

The following products are available to support the EIA-423-A signaling used with the DECserver 300, and to adapt from EIA-232-D signaling:

Table D-4: DEC OFFICE Cable and Adapters

Description	Order Code
10-ft terminated 6-conductor cable	BC16E-10
25-ft terminated 6-conductor cable	BC16E-25
50-ft terminated 6-conductor cable	BC16E-50
MMJ loopback connector	H3103
Package of 50 MMPs	H8220
1000 ft spool of unterminated 6-conductor cable	H8240
Crimping tool for 6-conductor cable	H8241
25-pin passive adapter — female to MMJ	H8571-A
9-pin passive adapter — female to MMJ	H8571-B
25-pin passive adapter — male to MMJ	H8571-C
25-pin passive adapter — male to MMJ	H8571-D
25-pin passive adapter — male to MMJ	H8571-E
6-conductor cable coupler	H8572
DECconnect SER cable — unshielded	BC23P-10
DECconnect SER cable — shielded	BC23R-10
H3104 — cable concentrator (unshielded)	H3104
H3104 — cable concentrator (shielded)	H3125
Non DECconnect:	Part Number
Male to 50-way champ connector to eight MMPs †	MOD-TAP 24-665-13
MMP to RJ12 (socket) †	MOD-TAP 09-100-650

† These adapters may be used for interconnection with non-DECconnect wiring schemes.

D.4 Transceiver Cables

BNE3x-xx transceiver cable — Available in FEP versions, for use in return air conduits, and in PVC versions, for use in nonenvironmental airspaces. The large diameter of this cable results in a lower signal cable loss per length of cable than the smaller diameter office transceiver cable. Two styles of connectors are available: a straight connector and a right angle connector.

The following cables are available:

- BNE3A-xx PVC, straight-connector transceiver cable
- BNE3B-xx PVC, right-angle connector transceiver cable
- BNE3C-xx FEP, straight-connector transceiver cable
- BNE3D-xx FEP, right-angle connector transceiver cable
- BNE3H-xx PVC, straight-connector, 802.3-compliant transceiver cable
- BNE3K-xx PVC, right-angle connector, 802.3-compliant transceiver cable
- BNE3L-xx FEP, straight-connector, 802.3-compliant transceiver cable
- BNE3M-xx FEP, right-angle connector, 802.3-compliant transceiver cable

The above cables are available in lengths of 5 meters (16.4 feet), 10 meters (32.8 feet), 20 meters (65.6 feet), and 40 meters (131.2 feet).

BNE4x-xx office transceiver cable — Available in PVC versions for use in non-environmental airspaces. The smaller diameter of this cable makes it ideal for use in office environments, however the smaller diameter results in a cable signal loss that is four times greater than that of BNE3x-xx transceiver cables. Two styles of connectors are available: a straight connector and a right angle connector.

The following cables are available:

- BNE4A-xx PVC, straight-connector transceiver cable
- BNE4B-xx PVC, right-angle connector transceiver cable
- BNE4C-xx PVC, straight-connector, 802.3-compliant transceiver cable
- BNE4D-xx PVC, right-angle connector, 802.3-compliant transceiver cable

The preceding cables are available in lengths of 2 meters (6.6 feet) and 5 meters (16.4 feet).

D.5 ThinWire Ethernet Cables

Two types of ThinWire coaxial cable are available for ThinWire Ethernet connection: FEP and PVC. FEP cabling is for use in return air conduits. PVC cabling is for use in air spaces that are not environmentally controlled. Table D-5 lists order codes and cable lengths for bulk ThinWire cables.

Table D-5: Thinwire Coaxial Cable and Connector Order Codes

Type	Length	Order Code
PVC	304.8 meters (1000 feet) roll	H8243-A
FEP	304.8 meters (1000 feet) roll	H8244-A

The ThinWire cable does not include BNC connectors. They must be ordered separately. Two male BNC connectors are needed for each ThinWire cable section — one each end. The order code for male ThinWire BNC connectors is H8222A.

How to Order Documents

All the information you need to order additional documents is provided here. The ordering procedure depends on:

- Whether you are a customer or a Digital employee.
- Your location: USA or Puerto Rico, Canada, or other.
- Your means of placing the order: telephone, electronic mail, or regular mail.

The specific ordering procedures and the order numbers for software and hardware manuals are provided in the following sections.

E.1 Order Numbers

For software manuals, use the documentation kit order number. For hardware manuals, use the document order number.

E.1.1 VMS Software Documentation Kits

The DECserver 300 documentation kit order number is QA-UTAA-GZ. The kit contains one of each of the following manuals:

- *DECserver 300 Introduction*
- *Local Area Transport (LAT) Network Concepts*
- *DECserver 300 Management*
- *Terminal Server Commands and Messages*
- *DECserver 300 Problem Solving*
- *DECserver 300 Use*

- *DECserver 300 Commands Quick Reference*
- *Terminals Server User's Reference Card*
- *DECserver 300 Software Installation*
- *Terminal Server Glossary*

E.1.2 TSM Documentation Kits

The TSM documentation kit order number is QLZ42-GZ. This kit is intended for the installer and manager of the TSM software product and contains two manuals:

- *Guide to Terminal Server Manager*
- *Terminal Server Manager Software Installation Guide*

E.1.3 ULTRIX-32 Software Documentation kit

The DECserver 300 ULTRIX-32 documentation kit order number is QA-VTVAA-GZ. This kit contains the same manuals as the VMS documentation kit except that the ULTRIX-32 kit contains the *DECserver 300 Software Installation (ULTRIX-32)* instead of the VMS version.

E.1.4 User Software Documentation Kit

The user documentation kit order number is QA-VTUAB-GZ. This kit is intended for the terminal users and contains only two manuals:

- *DECserver 300 Use*
- *Terminal Server User's Reference Card*

E.1.5 Hardware Documents

The order numbers for the hardware manuals are listed in Table E-1.

Table E-1: Hardware Documents

Manual Title	Order Number
DECserver 300 Hardware Installation/Owner's Guide	EK-A0366-IN
DECserver 300 Identification Card	EK-A0368-IC
DECserver 300 System Technical Description	EK-A0367-TM
DECconnect System Installation and Verification Guide	EK-DECSY-VG
DECconnet System Planning and Configuration Guide	EK-DECSY-CG

E.2 Ordering Procedures for Customers

If you are a customer, refer to Table E-2 and Table E-3 for ordering information.

Table E-2: How to Order by Phone

If You Live In	Call
USA	(800) DIGITAL
Puerto Rico	(800) 754-7575 x2012
Canada	(800) 267-6215

Table E-3: How to Order by Mail

If You Live In	Write to
USA or Puerto Rico ¹	Digital Equipment Corporation, P.O. Box CS2008, Nashua, New Hampshire 03061
Canada	Digital Equipment of Canada LTD., 940 Belfast Road, Ottawa, Ontario, Canada K1G 4C2 ATTN: A&SG Business Manager
Other	Digital Equipment Corporation, A&SG Business Man- ager, c/o Digital's local subsidiary or approved dis- tributor

¹Any prepaid order from Puerto Rico must be placed with the Local Digital
Subsidiary: (809) 754-7575 x2012

E.3 Ordering Procedures for Digital Employees

E.3.1 Software Documentation Kits

Use the *Internal Software Order Form* to order software documentation kits. The form is available from office services and the Software Distribution Center (SDC).

E.3.2 Hardware Manuals

You can place your order for hardware manuals by telephone, VAXmail, or DECmail as follows:

- Telephone number: (617) 351-4323 (DTN: 234-4322)
- DECmail address: ORDER @NRO

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Down-Line Load

This appendix explains how the server attempts to locate a load host and down-line load the server software image.

F.1 Down-Line Load

The down-line load process has three phases as shown below:

- **Load Request** — The server transmits load requests in an attempt to locate a load host. The seven-segment display shows a “4” during load request.
- **Load Backoff** — The server refrains from transmitting load requests for a period of time when previous requests have not resulted in a successful load. This is to reduce the burden on the available load hosts. The back-off period starts at 4 seconds and doubles each time, up to a maximum of 5 minutes. The seven-segment display shows a “3” during load backoff.
- **Image Transfer** — Loading of image after load host is located. The seven-segment display shows a “2” during image transfer.

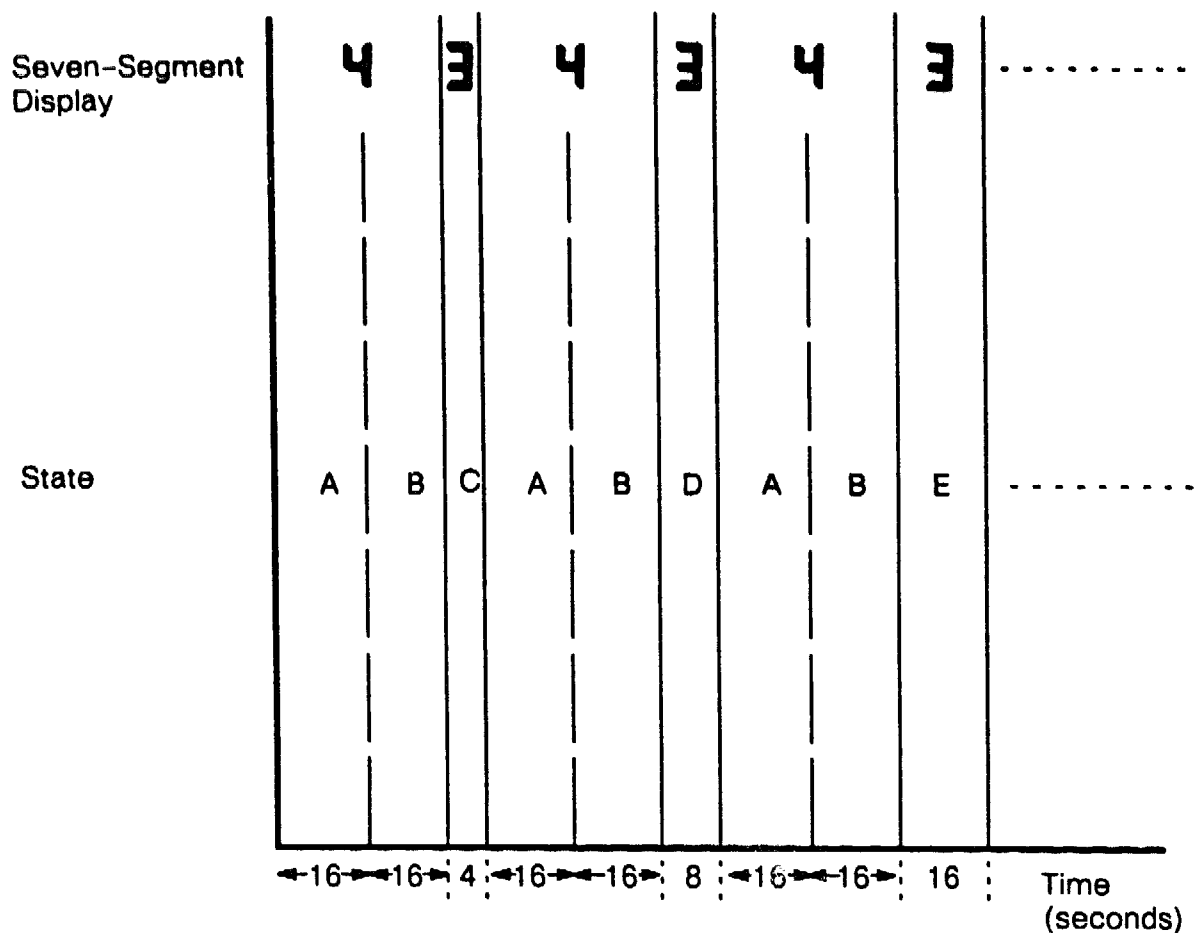
Note

The backoff state is only entered if the server has been unable to load a software image. Normally, the server goes from the “Load Request” state to the “Image Transfer” state.

The DECserver 300 down-line load process supports both Ethernet and ISO8802-2/3 (IEEE 802.2/802.3) on the LAN. The “Load Request” state is comprised of two parts, one of which uses ISO8802 format, and the other Ethernet format. When the server makes a load request, it first attempts to load using ISO8802 format. If unsuccessful, the server then attempts to load using Ethernet format. If the server is unsuccessful in both formats it enters the backoff state. At the end of the backoff state the server enters the load request state and starts again.

Figure F-1 shows the loading process when the server is unable to locate a load host. The diagram shows the use of the two datalink formats, the changes between the load request and backoff states as a function of time, and the corresponding seven-segment display codes.

Figure F-1: Down-Line Load — Server Unable to Locate Host



- A = Load Request, ISO8802 format
- B = Load Request, Ethernet format
- C = Backoff (1st, 4 seconds)
- D = Backoff (2nd, 8 seconds)
- E = Backoff (3rd, 16 seconds)

4 = Load Request
3 = Backoff